
MUSEUM
BELGICUM

Gen. 9. **Ectinosoma,** Boeck, 1864.

Generic Characters.—Body more or less slender, pronouncedly fusiform in shape, with the anterior division scarcely broader than the posterior. Cephalic segment gradually attenuated in front, and produced to a tongue-shaped hyaline rostral plate, arching over the bases of the anterior antennæ; lateral parts not very deep, almost wholly exposing the oral appendages. Epimeral plates of the 3 succeeding segments acute-angular behind. Last segment of metasome scarcely narrower than the preceding segment. Urosome gradually attenuated behind, genital segment without any trace of a transversal suture in the middle, last segment rather small and more or less deeply cleft. Caudal rami comparatively short, diverging, the 2 middle apical setæ closely juxtaposed and considerably thickened at the base. Anterior antennæ rather small, 5—7-articulate, and clothed with slender setæ. Posterior antennæ with the outer 2 joints confluent, outer ramus much more slender than the inner, and distinctly 3-articulate. Anterior lip compressed and more generally projecting in front to an acute recurved point. Mandibles sharply curved, with the masticatory part deeply cleft and armed with a limited number of simple teeth, outside which is attached a thickish seta; palp comparatively large, with the basal part much elongated, both rami uniarticulate, the inner one abruptly recurved and tipped with long setæ, outer ramus comparatively small. Maxillæ with the masticatory part armed with 3 or 4 strong, claw-like spines, palp divided into several setiferous lobes. Anterior maxillipeds consisting of 2 thickish basal joints, very movably articulated the one to the other, terminal part rudimentary, carrying 2 slender, claw-like spines curved anteriorly. Posterior maxillipeds issuing inside the anterior, slender, straight, 3-articulate, middle joint narrow and elongated, terminal joint small, tri-setose. First pair of natatory legs scarcely smaller than the others, with the inner ramus longer than the outer. Last pair of legs closely approximate, and each consisting of 2 well-defined joints, the proximal one forming inside a large lamellar expansion carrying 2 spiniform setæ, distal joint trilobate, each lobe tipped with a similar seta.

Remarks.—This genus was established in the year 1864 by Boeck, to include 3 Norwegian species, one of which, *E. melaniceps,* is perhaps identical with the form recorded by Baird as *Canthocamptus minuticornis* (Müller). Subsequently several new species have been added, chiefly by Prof. Brady and Th. Scott. The latter author, in his interesting Revision of the British Species of the Genera *Bradya* and *Ectinosoma,* records no less than 13 different species belonging to the present genus, and nearly the same number have been observed by myself off

the Norwegian coast. The species are rather difficult to distinguish from one another, on account of their rather uniform external appearance, and the generally small size and inconspicuous colour of the animal. Two of the best distingishing characters are undoubtedly the structure of the last pair of legs and the relative length of the setæ with which they are fringed. In these characters there are scarcely two species which fully agree with each other. All the species have in common the peculiarity that the specimens remain floating on the surface of the water, when they come in contact with it, a circumstance which essentially facilitates the collecting of them from any mud brought up by the aid of the dredge.

14. Ectinosoma Sarsi, Boeck.

(Pl. XVI).

Ectinosoma Sarsii, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forhandl. 1872, p. 45.

Syn: *Ectinosoma spinipes*, Brady.

Specific Characters.—Female. Body somewhat robust, fusiform, greatest width exceding $^1/_5$ of the length, and occurring somewhat in front of the middle. Cephalic segment about equalling in length the 3 succeeding segments combined, rostral plate evenly rounded at the tip. Urosome only slightly exceeding in length the exposed part of metasome, posterior edge of the segments densely fringed with delicate spinules. Caudal rami comparatively short, scarcely longer than the last segment, apical setæ not much elongated, the innermost but one about equal in length to the urosome exclusive of the caudal rami. Anterior antennæ short and thick, 5-articulate. Posterior antennæ with the outer ramus almost as long as the inner, middle joint very small. Anterior lip with an acute recurved process in front. Natatory legs with the rami rather broad, all the spines coarsely denticulate, setæ very strong. Last pair of legs sub-quadrangular in outline, inner expansion of the proximal joint rather narrow and extending almost as far as the distal joint, the latter somewhat longer than it is broad, and exhibiting on the lower side, near the base, a transverse row of 4 small denticles, immediately below which a slender bristle is attached; marginal spines of both joints unusually short, not extending beyond the middle of the genital segment.

Body of an uniform pale yellowish hue, or straw-coloured.

Length of adult female reaching to 1.50 mm.

Remarks.—This is the largest of all the known species, and may moreover in the living state be recognized by its pale yellow colour. The structure of the last pair of legs is also characteristic from the unusual shortness of the

marginal spines. The *E. spinipes* of Brady is unquestionably identical with Boeck's species.

Occurrence.—I have found this form not unfrequently in the upper part of the Christiania Fjord, as also in the Trondhjem Fjord, in depths ranging from 10 to 20 fathoms. Mr. Scott records it also from Finmark.

Distribution.—British Isles (Brady, Scott), coast of France (Canu), Novaya Zemlia, Spitsberg (Scott).

15. Ectinosoma neglectum, G. O. Sars, n. sp.

(Pl. XVII, fig. 1).

Specific Characters.—Female. Very like the preceding species, but of somewhat smaller size and less robust form of body. Cephalic segment about the length of the 4 succeeding segments combined, and gradually narrowed in front, rostral plate evenly rounded at the tip. Urosome considerably longer than the exposed part of the metasome, posterior edges of the segments very finely spinulose. Caudal rami somewhat divergent, nearly twice as long as they are broad, apical setæ not much elongated. Anterior antennæ resembling in structure those in *E. Sarsi*, being rather robust and 5-articulate. Anterior lip with an acute recurved projection in front. Last pair of legs somewhat resembling those in *E. Sarsi*, but with the distal joint more unequally trilobate, the outermost lobe occurring considerably farther forward than the innermost, marginal setæ both of this joint and the inner expansion of the basal one much more elongated, partly extending beyond the genital segment.

Male considerably smaller than female, and easily recognizable by the prehensile character of the anterior antennæ, and by the subdivision of the genital segment.

Colour light brown or corneous, with dark reddish shadows in front.

Length of adult female 1.30 mm., of male 0.70 mm.

Remarks.—This form is closely allied to *E. Sarsi*, and has most probably been confounded with it by other authors. On a closer comparison, it is however found to differ rather markedly in the structure of the last pair of legs, the marginal setæ of which are much more elongated. In the living state it is moreover at once distinguished from that species by its different colour.

Occurrence.—I have met with this form rather abundantly in several places of the Norwegian coast, from the Christiania Fjord to Vadsö. It is generally found in depths ranging from 10 to 20 fathoms, muddy bottom. No doubt it will also be found to occur out of Norway.

16. Ectinosoma propinqvum, Scott.

(Pl. XVII, fig. 2).

Ectinosoma propinqvum, Th. & A. Scott, Revision of the British Copepoda belonging to the genera Bradya and Ectinosoma; Transact. Linn. Soc. London, Vol. VI, Part 5, p. 428, Pl. 36, figs. 19, 27, 46; Pl. 37, figs. 2, 15, 32, 55; Pl. 38, figs. 9, 23, 34, 54.

Specific Characters.—Female. General form of body resembling that of the 2 preceding species. Cephalic segment, however, seen dorsally, more abruptly contracted in front, with the rostral plate more horizontal and narrowly spoon-shaped. Urosome comparatively shorter and less attenuated behind. Caudal rami very short, scarcely as long as they are broad, and considerably divergent. Anterior antennæ, as in the 2 preceding species, 5-articulate and rather stout. Anterior lip with a very acute recurved projection in front. Last pair of legs comparatively small, with the marginal spines unusually short, not extending beyond the middle of the genital segment.

Colour dark corneous.

Length of adult female 0.86 mm.

Remarks.—I think I am right in identifying the above-described form with Scott's *E. propinqvum*, with which it seems to agree fairly well in most of the anatomical details, though being somewhat inferior in size. It is closely allied to *E. neglectum*, and may easily be confounded with that species. On a closer examination, however, it is found to differ, not only in its much inferior size, but also in the narrowly exserted and spoon-shaped rostral plate, the much shorter caudal rami, and the structure of the last pair of legs, which, in the shortness of the marginal spines, more resembles that in *E. Sarsi*.

Occurrence.—I have found this form in 2 widely distant localities, viz., at Hvalör, lower part of the Christiania Fjord, and in the Trondhjem Fjord at Agdenæs and Bejan, the depth ranging from 3 to 20 fathoms. Mr. Scott also records it from Finmark, and it thus seems to occur along the whole Norwegian coast.

Distribution.—Firth of Forth (Scott), Ceylon (A. Scott).

17. Ectinosoma elongatum, G. O. Sars, n. sp.

(Pl. XVIII, fig. 1).

Syn? *Ectinosoma finmarchicum*, Scott.

Specific Characters.—Female. Body extremely slender and elongated, with the cephalic segment, seen dorsally, abruptly contracted in front, rostral

plate narrowly spoon-shaped and nearly horizontal. Caudal rami of moderate size, about equalling in length the last segment, and tapering somewhat distally, apical setæ not very divergent. Anterior antennæ more slender than in the 3 preceding species, and composed of 6 well-defined articulations. Anterior lip obtusely rounded in front, without any trace of a recurved projection. Natatory legs comparatively more slender than in the 3 preceding species. Last pair of legs of moderate size, with the distal joint rather broad and somewhat oblique, apical spines slender, setiform, and rather unequal, the innermost being much shorter than the other 2, inner expansion of proximal joint with a transverse row of delicate spinules at the base, outer seta much shorter than the outermost one of the distal joint.

Colour pale yellowish.

Length of adult female 0.88 mm.

Remarks.—This is a very slender species, and in so far resembles a form briefly recorded by Th. Scott from Finmark under the name of *E. finmarchicum*. It is, however, of somewhat smaller size, and moreover, to judge from the figures given, seems to exhibit some difference in the structure of the last pair of legs and in the interrelative length of their marginal spines.

Occurrence. The only locality where I have hitherto met with this form, is at Selven, near Agdenæs, Trondhjem Fjord. It here occurred not unfrequently in a depth of 3—6 fathoms, muddy sand.

18. Ectinosoma Herdmani, Scott.

(Pl. XVIII, fig. 2).

Ectinosoma Herdmani, Th. & A. Scott, Revision, &c. p. 432, Pl. 36, figs. 16, 44; Pl. 37, figs. 3, 16, 29, 54; Pl. 38, figs. 7, 25, 33, 47.

Specific Characters.—Female. Body slender, sublinear in form, with the cephalic segment, seen dorsally, considerably attenuated in front, rostral plate narrowly exserted, spoon-shaped. Caudal rami very short, not nearly as long as they are broad, apical setæ somewhat divergent. Anterior antennæ slender, 6-articulate. Anterior lip obtusely produced in front. Last pair of legs comparatively small, with the marginal spines short and thick, all of about the same size.

Colour whitish, semipellucid.

Length of adult female scarcely exceeding 0.60 mm.

Remarks.—This form, first described by Th. & A. Scott, somewhat resembles *E. elongatum* in the general form of the body, but is rather inferior in

size, and moreover is easily distinguished by the much shorter caudal rami and by the characteristic structure of the last pair of legs.

Occurrence.—Found occasionally, together with *E. elongatum*, at Selven, Trondhjem Fjord, and also at Tananger, south coast of Norway.

Distribution.—Firth of Forth, Isle of Man (Scott).

19. Ectinosoma melaniceps, Boeck.

(Pl. XIX, fig. 1).

Ectinosoma melaniceps, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forh. 1864, p. 30.

Syn? *Canthocamptus minuticornis*, Baird (not Müller).

Specific Characters.—Female. Body moderately slender, subfusiform in shape, with the cephalic segment, seen dorsally, gradually contracted in front, rostral plate obtusely rounded at the tip. Caudal rami about as long as they are broad, innermost apical seta more elongated than in most other species. Anterior antennæ rather slender and attenuated, composed of 7 well-defined articulations. Anterior lip with an angular projection in front. Last pair of legs of moderate size, distal joint comparatively broad and somewhat oblique, with the apical spines slender, setiform and rather unequal, appendicular bristle issuing from the margin between the 2 outermost spines; inner expansion of proximal joint comparatively small, with the inner apical spine quite short and remarkably broad, lanceolate in form, and coarsely serrate on the edges.

Colour grayish white, with a very conspicuous dark shade occupying the greater part of the cephalic segment.

Length of adult female 0.65 mm.

Remarks.—It seems to me very probable that the form recorded by Baird as *Canthocamptus minuticornis* is the present species. As, however, the identification of this form with *Cyclops minuticornis* of O. Fr. Müller cannot properly be accepted, the species must bear the name proposed for it by Boeck. It is easily recognizable from any of the other species by the dark-coloured cephalic segment, a character which indeed has given rise to the specific name assigned to it by Boeck. The last pair of legs also exhibit several peculiarities in their structure.

Occurrence.—This form is very common along the whole south and west coasts of Norway in comparatively shallow water among algæ, and may be easily detected, in spite of its small size, by the dark-coloured anterior part of the body. As with the other species of the present genus, on touching the surface of the

water, it remains floating upon it, and may thus easily be picked up from any freshly-taken sample.

Distribution.—British Isles (Brady, Scott), Spitsbergen (Scott).

20. Ectinosoma Normani, Scott.

(Pl. XIX, fig. 2).

Ectinosoma Normani, Th. & Scott, Revision, &c., p. 435, Pl. 36, figs. 21, 29, 39; Pl. 37, figs. 12, 26, 34, 51; Pl. 38, figs. 5, 18, 42, 45.

Specific Characters.—Female. Body somewhat more robust than in *E. melaniceps*, with the cephalic segment, seen dorsally, evenly contracted in front, rostral plate short and obtuse at the tip. A bright red pigmentary patch present on each side of the cephalic segment, just within the lateral edge and between the insertions of the anterior and posterior antennæ. Caudal rami of about the same appearance as in *E. melaniceps*, but with the innermost apical seta considerably shorter. Anterior antennæ likewise very similar in structure, though perhaps a little shorter. Anterior lip with an acute recurved projection in front. Last pair of legs not unlike those in *E. melaniceps*, distal joint, however, comparatively narrower, with the innermost apical spine longer, extending about as far as the outermost, appendicular bristle, as in *E. melaniceps*, issuing from the margin between the 2 outermost spines; inner expansion of proximal joint with the outer spine more slender and only very slightly lanceolate.

Colour uniformly whitish grey.

Length of adult female 0.55 mm.

Remarks.—The above-described form is unquestionably that recorded by Messrs. Th. & A. Scott under the name of *E. Normani*. At first I believed it to be *E. erythrops* of Brady, on account of the very conspicuous red pigmentary patches occurring within the lateral edges of the cephalic segment in front. But Messrs. Th. & A. Scott describe as Brady's species a very different form, unknown to me, though apparently referable to the Fauna of Norway, having been recorded by one of these authors from Finmark. The species here under discussion is nearly allied to *E. melaniceps*, though at once distinguished by its uniform colour and the very conspicuous red ocular patches in front. It is also rather inferior in size.

Occurrence.—Only 2 specimens of this form have hitherto come under my notice. They were both taken in the upper part of the Christiania Fjord

from a depth of about 6 fathoms, muddy bottom. Th. Scott records this form also from Vadsö, Finmark.

Distribution.—Firth of Forth, Barrow Strait (Th. Scott), Ceylon (A. Scott).

21. Ectinosoma curticorne, Boeck.

(Pl. XX, fig. 1).

Ectinosoma curticorne. Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 45.

Specific Characters.—Female. Body moderately slender, fusiform in shape, greatest width in front of the middle. Cephalic segment, seen dorsally, evenly contracted in front, rostral plate comparatively short and bluntly rounded at the tip. Caudal rami nearly twice as long as they are broad and slightly divergent. Anterior antennæ very short, though composed of 6 well-defined articulations, the 1st of which exhibits inside a very conspicuous dark pigmentary patch. Anterior lip with a blunt prominence in front, clothed at the hind edge with long cilia. Last pair of legs well developed, clothed on the lower face with several transverse rows of delicate spinules, distal joint somewhat unequally trilobate, apical spines very slender and elongated, setiform, the innermost one longer than the outermost; inner expansion of proximal joint extending about to the middle of the distal joint.

Colour dark brown or corneous.

Length of adult female 0.70 mm.

Remarks.—This form, first recorded by Boeck, may be easily distinguished from any of the preceding species by the unusually short anterior antennæ and the very conspicuous dusky pigment-patch inside the 1st joint of the latter. The form of the anterior lip and the structure of the last pair of legs are also rather characteristic. In the opinion of Th. Scott, the *Bradya Edwardsii* of Ricard is identical with this species.

Occurrence.—Only very few specimens of this form have hitherto come under my notice. They were all of them taken in the upper part of the Christiania Fjord in a depth of 6—20 fathoms, muddy bottom. The specimen observed by Boeck was also from the Christiania Fjord. Th. Scott, however, records this form from 2 localities of the Finmark coast, viz., Bugö Fjord and Vadsö.

Distribution.—Scottish coast (Scott), Spitsbergen (Scott).

22. Ectinosoma gothiceps, Giesbrecht.

(Pl. XX, fig. 2).

Ectinosoma gothiceps, Giesbrecht, Die freilebenden Copepoden der Kieler Föhrde, p. 106, Pl. I, figs. 3, 12; Pl. IV, figs. 17, 35; Pl. V, fig. 3; Pl. VII, fig. 8; Pl. VIII, figs. 10, 11; Pl. IX, fig. 17; Pl. X, figs. 10, 21; Pl. XI, fig. 13; Pl. XII, figs. 6, 10.

Syn? *Ectinosoma pygmæum*, Scott.

Specific Characters.—Female. Very like the preceding species, but of much smaller size and somewhat less slender. Cephalic segment, seen dorsally, evenly contracted in front, rostral plate of moderate size and obtusely acuminate at the tip. Caudal rami very short, not nearly so long as they are broad. Anterior antennæ short, 6-articulate, resembling those in *E. curticorne*, but without any pigmentary patch inside the 1st joint. Anterior lip with a short acute projection in front. Last pair of legs comparatively smaller than in *E. curticorne*, but with the marginal spines very long and considerably thickened at the base; distal joint shorter and less unequally trilobate than in the above species, outermost apical spine considerably longer than the innermost; inner expansion of proximal joint very short.

Colour whitish gray.

Length of adult female 0.45 mm.

Remarks.—The above-described form is unquestionably that recorded by Dr. Giesbrecht as *E. gothiceps*, and I am also of opinion that the *E. pygmæum* of Scott is referable to the same species. It is closely allied to *E. curticorne*, but of much inferior size, and is moreover distinguished by the short caudal rami, the absence of the pigmentary patch on the anterior antennæ, and also by the somewhat different structure of the anterior lip and the last pair of legs.

Occurrence.—I have met with this small species occasionally in several places both on the south and west coasts of Norway, as also in the Trondhjem Fjord, in moderate depths.

Distribution.—Kiel Bay (Giesbrecht), Firth of Forth, Isle of Man (Scott).

23. Ectinosoma mixtum, G. O. Sars, n. sp.

(Pl. XXI, fig. 1).

Specific Characters.—Female. Body moderately slender, with the cephalic segment, seen dorsally, gradually contracted in front, rostral plate well developed and somewhat deflexed, narrowly rounded at the tip. Caudal rami about as long

as they are broad, apical setæ rather slender. Anterior antennæ comparatively short, though longer than in the 2 preceding species, and composed of 6 articulations. Anterior lip with a small recurved projection in front. Last pair of legs of moderate size, with the marginal spines very unequal, distal joint much longer than the proximal one and subquadrangular in form, innermost apical spine very short, appendicular bristle, as in most other species, remote from the margin; inner expansion of proximal joint extending almost to the tip of the distal joint, outer spine remarkably thickened, somewhat resembling that in *E. melaniceps*, though considerably more elongated.

Colour grayish white.

Length of adult female 0.58 mm.

Remarks.—I cannot identify this form with any of the species described by Messrs. Th. & A. Scott. The specific name here proposed refers to the somewhat mixed characters, some of which resemble those of *E. curticorne*, and some those of *E. melaniceps*.

Occurrence.—Only some few specimens of this form have hitherto come under my notice. They were taken in the upper part of the Christiania Fjord, near the town, in a depth of about 3 fathoms, muddy bottom.

24. Ectinosoma brevirostre, G. O. Sars, n. sp.

(Pl. XXI, fig. 2).

Specific Characters.—Female. Body comparatively slender and somewhat compressed, with the cephalic segment, seen dorsally, but slightly contracted in front, rostral plate remarkably short and blunt at the tip. Caudal rami longer than they are broad, and somewhat obliquely truncated at the tip, apical setæ of moderate length. Anterior antennæ more slender and attenuated than in *E. mixtum*, but, as in that species, 6-articulate. Anterior lip with a similar acute recurved projection in front. Last pair of legs with the proximal joint rather large and broad, distal joint considerably shorter, being scarcely longer than it is broad, innermost apical spine exceeding half the length of the outermost one, appendicular bristle issuing near the margin; inner expansion of proximal joint scarcely extending beyond the middle of the distal joint, and exhibiting at the base an oblique transverse row of delicate spinules, outer apical spine of quite normal appearance.

Colour yellowish gray.

Length of adult female 0.55 mm.

Remarks.—This new species is chiefly characterised by the unusually short rostral plate, a character which has given rise to the specific name here proposed. In its general appearance it somewhat resembles *E. gracile*, Scott, the body being, as in that form, considerably compressed. It differs, however, very markedly in the structure of the anterior maxillipeds, which is quite normal, as also in that of the last pair of legs.

Occurrence.—Only a single, but well-preserved ovigerous specimen of this form was found last summer at Bejan, outer part of the Trondhjem Fjord, in a depth of 20—30 fathoms.

25. Ectinosoma gracile, Scott.

(Pl. XXII, fig. 1).

Ectinosoma gracile, Th. & A. Scott, Revision, p. 429, Pl. 36, figs. 18, 37; Pl. 37, figs. 13, 28, 45; Pl. 38, figs. 3, 27, 30.

Specific Characters.—Female. Body exceedingly slender and much compressed, seen dorsally, almost linear in form. Cephalic segment evenly contracted in front, rostral plate somewhat deflexed and blunt at the tip. Caudal rami about as long as they are broad, apical setæ rather slender. Anterior antennæ comparatively slender and attenuated, though composed of only 6 articulations, the penultimate one being very narrow and elongated. Anterior lip with the usual recurved projection in front. Anterior maxillipeds unusually powerful, with the 2nd basal joint more than twice as long as the 1st, and considerably dilated at the base, apical claws very slender and minutely denticulate. Last pair of legs comparatively small, but with the marginal spines rather elongated, distal joint regularly trilobate, with the innermost apical spine longer than the outermost; appendicular bristle some distance from the margin; inner expansion of proximal joint unusually short.

Colour whitish gray.

Length of adult female 0.55 mm.

Remarks.—This is a rather anomalous form, differing, among other things, from the other known species of this genus very markedly in the structure of the anterior maxillipeds. I have been enabled to prove the identity of this form with that described by Mr. Scott, by comparing it with some specimens kindly sent to me by that author.

Occurrence.—Some few specimens of this form were found last summer in the Trondhjem Fjord, at Agdenæs. They occurred in a depth of about 50 athoms, on a bottom consisting of coarse sand.

Distribution.—Firth of Forth, Isle of Man (Scott).

Gen. 10. **Pseudobradya**, G. O. Sars, n.

Syn: *Bradya*, Scott (part).

Generic Characters.—General form of body resembling that of *Ectinosoma*, being more or less pronouncedly fusiform. Caudal rami often much elongated. Anterior antennæ comparatively short, with the proximal joints more or less expanded. Posterior antennæ with the outer ramus poorly developed and in some cases consisting of only 2 joints. Anterior lip not forming any projection in front. Mandibles and maxillæ resembling in structure those in *Ectinosoma*. Anterior maxillipeds generally very small, with the 2 basal joints bent at almost a right angle, terminal part consisting of 3 well-defined, though very short joints carrying comparatively short setæ, 2 of which are generally spiniform. Posterior maxillipeds less slender than in *Ectinosoma*. Last pair of legs generally very large, lamellar, though somewhat varying in shape in the different species, distal joint always well developed, appendicular bristle in some cases very strong and issuing from the lower face of the proximal joint.

Remarks.—This new genus is established to include a number of species referred by Mr. Scott to the genus *Bradya* of Boeck, chiefly on account of some similarity in the structure of the posterior maxillipeds. These appendages are, however, in reality not nearly so powerfully developed as in *Bradya*, and on a closer comparison, several other differences in the anatomical details are found to exist, which would seem to warrant the establishment of a separate genus, somewhat intermediate in character between *Ectinosoma* and *Bradya*. Among these differences may be mentioned the poor development of the outer ramus of the posterior antennæ, the somewhat different shape of the posterior maxillipeds and the very highly developed last pair of legs. The caudal rami, moreover, in most of the species, are unusually prolonged, and the general form of the body is rather unlike that in *Bradya*, and much more resembling that in *Ectinosoma*. Of the 5 species described by Mr. Scott and referable to the present genus, I have succeeded in finding 2 off the Norwegian coast, and also a 3rd species which I regard as new to science.

26. Pseudobradya minor (Scott).

(Pl. XXII, fig. 2).

Bradya minor, Th. & A. Scott, Revision, p. 425, Pl. 35, figs. 5, 9, 13, 21, 24, 31, 35, 42; Pl. 36, figs. 5, 9.

Specific Characters.—Female. Body unusually short and stout, pronouncedly fusiform, with the greatest width in the middle. Cephalic segment, seen dorsally, gradually tapering in front, rostral plate prominent, nearly horizontal, and obtusely acuminate at the tip. Caudal rami of moderate size, scarcely longer than they are broad, apical setæ not much elongated. Anterior antennæ somewhat less abbreviated than in the other species, and composed of 6 well-defined articulations, the 1st of which exhibits inside a very conspicuous dark pigmentary patch. Outer ramus of posterior antennæ about the length of the 1st joint of the inner, and very narrow, 3-articulate. Anterior lip quite evenly rounded in front. Anterior maxillipeds with the 2nd basal joint somewhat longer than the 1st. Natatory legs rather strongly built. Last pair of legs of moderate size and clothed on the lower face with several rows of delicate spinules, marginal spines not much elongated and but slightly unequal; appendicular bristle normal, issuing from the lower face of the distal joint; the latter oval in form, with the outermost lobe occurring far in front of the innermost; inner expansion of proximal joint comparatively short, scarcely extending to the middle of the distal joint.

Colour yellowish brown.

Length of adult female 0.54 mm.

Remarks.—The above-described form is unquestionably identical with that recorded by Mr. Scott as *Bradya minor*. It may easily be recognized from any of the other species by the unusually short and robust form of the body, and by the very conspicuous black pigmentary patches inside the 1st joint of the anterior antennæ.

Occurrence.—Some specimens of this form were found last summer in the Trondhjem Fjord, at Selven, near Agdenæs, in a depth of 3—6 fathoms, muddy sand.

Distribution. —Firth of Forth, Liverpool Bay (Scott).

27. Pseudobradya acuta, G. O. Sars, n. sp.

(Pl. XXIII, fig. 1).

Specific Characters.—Female. Body rather slender, subfusiform in shape, with very thin and soft integuments. Cephalic segment, seen dorsally, considerably

contracted in front, with the rostral plate nearly horizontal and terminating in a very acute point. Urosome rather massive and but slightly attenuated behind. Caudal rami comparatively large and broad, about twice as long as the last segment, apical setæ slender and elongated. Anterior antennæ very short, 6-articulate, with the proximal joints considerably expanded. Posterior antennæ with the outer ramus very narrow, 3-articulate, the first 2 joints quite short. Anterior maxillipeds extremely small, with the 2nd basal joint scarcely larger than the 1st. Natatory legs comparatively more slender than in the preceding species. Last pair of legs very largely developed and quite smooth below, marginal spines much elongated, setiform, some of them extending as far as the tip of the caudal rami; distal joint oblong oval in form, and regularly trilobate at the end, appendicular bristle unusually prolonged and issuing from the lower face of the proximal joint; inner expansion of the latter extending about to the middle of the distal joint, outer apical spine rather elongated, though somewhat shorter than the inner.

Colour whitish gray.

Length of adult female 0.70 mm.

Remarks.—This form, which I cannot identify with any of the species described by Mr. Scott, is easily recognizable by the acutely produced rostral plate, and the large size of the last pair of legs, the marginal spines of which are more elongated than in any other form known to me.

Occurrence.—Only 2 specimens of this form, both adult females, were found, together with the preceding species at Selven, Trondhjem Fjord.

28. Pseudobradya similis (Scott).

(Pl. XXIII, fig. 2).

Bradya similis, Th. & A. Scott, Revision, p. 424, Pl. 35, figs. 3, 7, 16, 27, 33, 41, 48, Pl. 36, figs. 3, 10.

Specific Characters.—Female. Body moderately slender, with highly chitinized integuments. Cephalic segment, seen dorsally, evenly contracted in front, rostral plate somewhat deflexed and obtuse at the tip. Urosome less massive than in *P. acuta*, slightly tapering distally. Caudal rami remarkably large and elongated, equalling in length the last 2 segments combined; apical setæ comparatively short. Anterior antennæ resembling in structure those in *P. acuta*. Last pair of legs comparatively large, though somewhat less broad than in *P. acuta*, and clothed on the lower face with several transverse rows of delicate spinules, marginal spines of moderate length and somewhat unequal; distal joint oblong

oval in form, unequally trilobate at the end, the outermost lobe occurring far in front of the innermost one; appendicular bristle very strong, spiniform, and, as in *P. acuta*, issuing from the lower face of the proximal joint; inner expansion of the latter rather narrow, and extending somewhat beyond the middle of the distal joint, outer apical spine very small.

Colour yellowish brown.

Length of adult female 0.59 mm.

Remarks.—This form, the identity of which with *Bradya similis* of Scott I cannot doubt, may be easily distinguished from any of the 2 preceding species by the remarkably prolonged caudal rami, in which respect it agrees with 2 other species described by Mr. Scott, viz., *P. elegans* and *P. hirsuta*. It is, however, of much smaller size than either of these species.

Occurrence.—Only 2 specimens of this form were found last summer, together with the 2 preceding species at Selven, Trondhjem Fjord.

Distribution.—Firth of Forth (Scott).

Gen. 11. **Microsetella,** Brady & Robertson, 1873.

Generic Characters.—Body very slender, with the anterior division scarcely broader than the posterior. Cephalic segment projecting in front in a short, deflexed rostrum. Epimeral plates of this and the 3 succeeding segments well developed, partly including between them the oral appendages and the basal parts of the natatory legs. Caudal rami short, with the 2 middle apical setæ greatly elongated. Anterior antennæ slender and elongated, with only scattered bristles; those in male distinctly geniculate, terminal part rather prolonged. Posterior antennæ with the outer ramus much shorter and narrower than the inner, 3-articulate. Anterior lip not produced in front. Mandibles with the palp very large, distal joint spatulate in form and about the size of the proximal one, carrying at the lower edge a remarkably strong spiniform seta, clothed along one of the edges with long cilia; outer ramus very small. Maxillæ of more simple structure than in *Ectinosoma*, the palp apparently consisting of only 2 setiferous lobes. Anterior maxillipeds comparatively small, resembling in structure those in *Ectinosoma*. Posterior maxillipeds, however, more strongly built, with the middle joint rather expanded. Natatory legs with the rami slender and narrow. Last pair of legs built, on the whole, upon the same type as in *Ectinosoma*.

Remarks.—This genus was established in the year 1873 by Messrs. Brady & Robertson to comprise a small Harpacticoid, *M. atlantica* B. & R., taken by them in the open sea by the aid of the surface-net. The genus was subsequently withdrawn by Prof. Brady, who in his Monograph described it as *Ectinosoma atlanticum*, believing that the anatomical differences were not sufficient to remove it from that genus. Dr. Giesbrecht has, however, again restored the original genus, adding another nearly-related form, *M. rosea* (Dana). I am also myself of opinion that the genus *Microsetella* ought to be maintained, differing, as it does, from *Ectinosoma*, not only in the peculiar habits of the species, but also in some anatomical details mentioned in the above diagnosis. Of the 2 hitherto known species, only one belongs to the fauna of Norway.

29. Microsetella norvegica (Boeck).

(Pl. XXIV).

Setella norvegica, Boeck, Oversigt over de ved Norges Kyster iagttagne Copepoder. Chr. Vid. Selsk. Forh. 1864, p. 281.

Syn: *Ectinosoma atlanticum*, Brady.

Specific Characters—Female. Body extremely slender, nearly linear in form, the greatest width scarcely exceeding $^1/_6$ of the length. Cephalic segment only very slightly vaulted above, seen dorsally, gradually contracted in front, rostrum short and abruptly deflexed. Urosome about half the length of the anterior division of the body, segments clothed with several circlets of delicate spinules. Caudal rami scarcely longer than they are broad, apical setæ more or less divergent, the innermost but one about twice the length of the urosome. Anterior antennæ exceeding half the length of the cephalic segment, and composed of 6 articulations, terminal part fully as long as the proximal one. Last pair of legs with the distal joint scarcely as long as the proximal one, and rounded in form, innermost apical spine very small, the other 2 considerably elongated, setiform, appendicular bristle normal; inner expansion of proximal joint large, extending as far as the distal joint, inner apical spine much shorter than the outer.

Male somewhat smaller than female, and easily recognizable by the geniculate anterior antennæ and the bipartite genital segment.

Body pellucid, white, with a faint yellowish tinge.

Length of adult female 0.46 mm., of male 0.38 mm.

Remarks.—There cannot, in my opinion, be any doubt that the form briefly recorded by Boeck as *Setella norvegica* is this species, and therefore, according

to the rules of priority, the specific name proposed by Boeck ought to be preferred to that subsequently given to this form by Messrs. Brady and Robertson. It differs from the 2nd species, *M. rosea*, in its much inferior size, and in the less elongated caudal setæ.

Occurrence.—Unlike what is generally the case with the Harpacticoida, this form is a true pelagic animal, scarcely ever to be found at the bottom. I have observed it in several places off the Norwegian coast, and always near the surface of the sea and generally at a considerable distance from the shore. In some plankton-samples examined by me, it occurred in great abundance.

Distribution.—British Isles, Atlantic Ocean, widely distributed, Arctic Ocean, Mediterranean, Pacific, Red Sea, Indian Ocean.

Gen. 12. **Bradya**, Boeck, 1872.

Generic Characters.—General form of body not unlike that of *Ectinosoma*, anterior division, however, somewhat broader and slightly depressed. Rostral plate comparatively short and blunt at the tip. Urosome conspicuously narrower than the anterior division of the body; caudal rami not much elongated, and wide apart. Anterior antennæ short and stout, densely setiferous, and composed of 6 or 7 articulations. Posterior antennæ with the outer ramus more fully developed than in the other genera of this family, being scarcely shorter than the inner, subfusiform, and distinctly 3-articulate. Anterior lip not produced in front. Mandibles with the cutting edge divided into numerous teeth, palp rather large, with the outer ramus more fully developed than in the other genera. Maxillæ normally developed, the palp having outside 2 setiferous lamellæ. Anterior maxillipeds rather powerful, with the 2 basal joints bent at nearly a right angle, terminal part short, but distinctly 3-articulate, and clothed with several short setæ, one of which is much stronger than the others and claw-shaped. Posterior maxillipeds likewise rather fully developed, 1st joint carrying at the end inside a strong deflexed seta, and another smaller one at the outer corner, middle joint lamellarly expanded and provided with an oblique row of delicate spinules, last joint imperfectly defined at the base, and carrying 4 ciliated setæ. Natatory legs with the rami comparatively broad. Last pair of legs poorly developed, with the distal joint rather small or wholly absent.

Remarks.—In the restriction here adopted, this genus is chiefly characterised by the somewhat dilated and depressed anterior division of the body, the rather full development of the outer ramus of the posterior antennæ, and partly also, by the structure of the 2 pairs of maxillipeds and the last pair of legs. Two well-defined species of this genus occur off the Norwegian coast.

30. Bradya typica, Boeck.

(Pl. XXV).

Bradya typica, Boeck, Nye Slægter og Arter af Saltvandscopepoder. Chr. Vid. Selsk. Forh. 1872, p. 47.

Specific Characters.—*Female.* Anterior division of body moderately dilated, greatest width scarcely attaining half the length; rostral plate slightly deflexed and narrowly rounded at the tip. Epimeral plates projecting behind in an acute corner. Urosome exceeding half the length of the anterior division, last segment deeply cleft. Caudal rami a little longer than they are broad, and considerably divergent, apical setæ of moderate length. Anterior antennæ short and thick, consisting of 7 well-defined articulations, the penultimate one with a remarkably strong seta in front, last joint very small, nodiform. Anterior maxillipeds with the 2nd basal joint smaller than the 1st, unguiform spine not very strong. Last pair of legs rather distant the one from the other, marginal spines very unequal, some of them rather slender, setiform; distal joint well defined, though comparatively small, subquadrangular, with the outermost apical spine much smaller than the other 2, appendicular bristle slender and elongated; inner expansion of proximal joint with 2 unequal spines at the tip.

Colour whitish gray.

Length of adult female 0.90 mm.

Remarks.—This form was first recorded by Boeck, and subsequently described and figured by Prof. Brady in his well-known Monograph. It is easily recognizable from any of the other species referred by Mr. Scott to this genus, both by the outer habitus and by some of the anatomical details.

Occurrence.—I have met with this form in several places on the Norwegian coast from the Christiania Fjord to Trondhjem Fjord. Mr. Th. Scott records it also from Finmark. It occurs in depths ranging from 10 to 30 fathoms, muddy bottom.

Distribution.—British Isles (Brady, Scott).

31. Bradya dilatata, G. O. Sars. n. sp.
(Pl. XXVI).

Specific Characters.—Female. Anterior division of body considerably dilated, seen dorsally, broadly oval in form, with the greatest width exceeding half the length. Rostral plate well developed, narrowly rounded at the tip. Urosome scarcely more than half as long as the anterior division of the body, and much narrower. Caudal rami about as in *B. typica.* Anterior antennæ composed of only 6 articulations, the last 2 being confluent. Posterior antennæ, mandibles, maxillæ, and posterior maxillipeds, of much the same structure as in *B. typica.* Anterior maxillipeds, however, considerably more powerful, with the 2nd basal joint fully as large as the 1st, and the apical claw remarkably strong. Natatory legs rather short, with unusually broad, flattened rami. Last pair of legs very small and imperfectly developed, each forming a simple setiferous lamella, without any trace of subdivision.

Colour whitish gray.

Length of adult female 1.20 mm.

Remarks.—This form, though closely agreeing with *B. typica* in most of the structural details, may be at once distinguished by the much broader form of the anterior division of the body, the very powerfully developed anterior maxillipeds, and the peculiar rudimentary condition of the last pair of legs. It also grows to a considerably larger size.

Occurrence.—Only 2 female specimens of this form have hitherto come under my notice. They were taken many years ago in the upper part of the Christiania Fjord, in a depth of about 30 fathoms.

Section II. Chirognatha.

Remarks.—As stated above, the forms belonging to this section are chiefly characterised by the structure of the posterior maxillipeds, which, unlike those in the preceding section, constitute more or less powerful prehensile organs, terminating in a clawed hand. Of the 2 subsections into which it is divided, that of the *Dactylopoda* is by far the most extensive, and I propose to treat of this subsection in the first place.

Subsection 1. Dactylopoda.

Chief Character. First pair of legs unlike the others, and more or less distinctly prehensile.

Fam. 5. Harpacticidæ.

Characters.—Body of various form, in some cases slender and compressed or sub-depressed, in other cases much abbreviated and flattened. Rostrum well defined at the base, and to some extent mobile. Eye present. Anterior antennæ comparatively slender, with the proximal part consisting of 4 well-defined joints, terminal part of 4 or 5 much smaller articulations; those in male strongly prehensile, terminating in a clawed hand. Posterior antennæ rather powerful, biarticulate, distal joint more or less spatulate, and armed at the tip with 3 strong, claw-like spines, and behind them with 4 geniculated setæ, outer ramus comparatively small, and issuing from the middle of the proximal joint. Mandibles highly incrustated, with short and blunt cutting teeth, palp of moderate size, with 2 slender recurved rami. Maxillæ normal. Anterior maxillipeds short and stout, with several digitiform lobes in front, the outermost one carrying an unguiform spine. Posterior maxillipeds more or less powerfully developed, subcheliform. First pair of legs with both rami distinctly prehensile and very unequal, the outer one being much the longer, and armed at the tip with a number of curved claws, the inner one with a single such claw. Natatory legs with both rami 3-articulate, the outer one being the larger. Last pair of legs lamellar, biarticulate, proximal joint in female more or less expanded inside. Ovisac single.

Remarks.—In the restriction here adopted, this family is chiefly characterised by the structure of the 1st pair of legs, the rami of which are very unequal in length and both prehensile. It comprises at present 3 genera, all of which are represented in the fauna of Norway.

Gen. 13. **Harpacticus,** M.-Edwards, 1838.

Syn: *Arpacticus,* Baird.

Generic Characters.—Body slender, compressed, or slightly depressed, tapering behind. Urosome normal, with none of the segments expanded laterally, and considerably narrower in male than in female. Caudal rami short, more or less divergent, one of the apical setæ considerably elongated. Rostrum conically produced, and more or less curved downwards. Anterior antennæ in female 8- or 9-articulate; those in male very strong, with the 1st joint divided into 2 articulations, last joint of the proximal part globularly expanded, terminal part very movable, claw-shaped. Posterior antennæ with the apical spines simple, outer ramus composed of only 2 joints. Posterior maxillipeds generally very powerful, with the hand considerably expanded. First pair of legs with the outer ramus biarticulate, and nearly twice as long as the inner, apical claws but slightly curved. Inner ramus of 2nd pair of legs in male with the middle joint produced at the end outside to a long deflexed mucroniform projection; 3rd pair of same with the outer ramus exceedingly strong, curving more or less inwards, and having the spines very coarse, whereas the natatory setæ are rudimentary. Last pair of legs of moderate size, with the marginal spines, as a rule, not much prolonged, distal joint oval, inner expansion of proximal joint in female comparatively broad, in male rudimentary.

Remarks.—This genus was established as early as the year 1838 by M.-Edwards, to include the *Cyclops chelifer* of O. Fr. Müller. Several additional species have subsequently been described by different authors; but some of these species are now generally referred to other genera, or even to quite different families. One of the most characteristic features by which the present genus is distinguished from the 2 other genera of this family, is the peculiar transformation in the male of the outer ramus of the 3rd pair of legs, which constitutes a most powerful prehensile organ, by the aid of which, apparently, the female is grasped during copulation. To the fauna of Norway belong 4 distinct species, to be described below.

32. Harpacticus chelifer (Müller).

(Pl. XXVII & XXVIII).

Cyclops chelifer, O. Fr. Müller, Entomostraca, p. 114, Pl. XIX, figs. 1—3.

Specific Characters.—Female. Body pronouncedly compressed, especially in its anterior part, seen dorsally, very narrow, with the greatest width quite in

front, and gradually tapering behind. Cephalic segment rather large and deep, with the rostrum very prominent. Epimeral plates of the 3 succeeding segments rounded at the lateral corners. Last pedigerous segment comparatively small. Urosome not attaining half the length of the anterior division, posterior edges of the segment finely spinulose. Caudal rami about as long as they are broad, and somewhat divergent, apical setæ rather slender, the innermost but one about twice the length of the urosome. Anterior antennæ comparatively slender 8-articulate, terminal part not attaining $^1/_3$ of the length of the antenna. Posterior antennæ very greatly developed, outer ramus, however, small, with 6 setæ. Posterior maxillipeds exceedingly large and powerful, hand nearly globose in form, with the palm somewhat hollowed, its upper angle coarsely denticulate, dactylus very strong and curved. First pair of legs rather strongly built, joints of the outer ramus of about equal length, the distal one armed at the tip with 3 finely denticulated claws; inner ramus 3-articulate, the outer 2 joints very small and imperfectly defined, apical claw of same appearance as those of the outer ramus. Natatory legs with the outer ramus much stronger than the inner, 1st joint the largest, terminal joint rather narrow, with 4 coarse spines outside gradually increasing in length distally. Last pair of legs with the inner expansion of the proximal joint moderately broad, and provided with only 3 marginal spines. Ovisac generally not very large, oval in form.

Male somewhat larger than female, with the urosome narrower. Anterior antennæ very powerful, hand strongly dilated, dactylus simple. Outer ramus of 3rd pair of legs exceedingly large and robust, with the 1st joint fully as long as the other 2 combined, last joint spatulate, armed with 3 very thick spines. Last pair of legs much smaller than in female, distal joint oblong quadrangular in form, proximal one not at all expanded inside.

Colour light yellow.

Length of adult female 0.90 mm., of male about 1 mm.

Remarks.—The above-described form is unquestionably that originally recorded by O. Fr. Müller as *Cyclops chelifer*. In some cases, however, quite different forms have been identified with Müller's species. Prof. Brady has apparently confounded this species with *H. gracilis* of Claus, and some of the figures given in his Monograph seem indeed to be more properly referable to that form. On a closer examination, the present species may be easily recognized by the pronouncedly compressed form of the body, and by the unusually large posterior maxillipeds. Moreover, both in the structure of the antennæ and of the legs, well-marked differences from the other species are found to exist.

Occurrence.—This is one of the commonest of our Harpacticoids, being

found rather abundantly along the whole Norwegian coast, from the Christiania Fjord to Vadsö. It is a true littoral form, occurring in quite shallow water close to the shore, among algæ, and not infrequently left in tidal pools together with other littoral species. It moves in a somewhat jerky manner; but it is more frequently found clinging to the algæ or other submarine objects. The two sexes are often found tied together in copula, the male having a firm hold of the female by the aid of his powerful clawed anterior antennæ, which are inserted within the hind edge of the cephalic segment of the female.

Distribution. British Isles (Brady), Heligoland (Claus), coast of Bohuslän (Coll. Cleve), coast of France (Canu), Arctic Ocean (Scott), coast of North America, Ceylon (A. Scott).

33. Harpacticus uniremis, Kröyer.

(Pl. XXIX).

Harpacticus uniremis, Kröyer, in Gaimard's Voyage en Scandinavie, Pl. 43, fig. 1, a—p.

Syn: *Harpacticus nordlandicus*, Boeck.

„ — *chelifer, var. arctica*, Poppe.

Specific Characters.—Female. Body moderately slender, subdepressed, with the greatest width equalling about $^1/_3$ of the length, and occurring a little in front of the middle. Cephalic segment rather large, but less deep than in *H. chelifer*, rostrum broader and more obtuse at the tip. Epimeral plates of the 3 succeeding segments somewhat expanded laterally, and acutely produced at the lateral corners. Last segment of metasome rather broad. Urosome gradually somewhat coarctated behind, with the hind edges of the segments coarsely spinulose ventrally. Caudal rami very short, scarcely as long as they are broad, apical setæ slender, the innermost but one more than twice as long as the urosome. Anterior antennæ moderately slender, 9-articulate, terminal part considerably exceeding half the length of the proximal one. Posterior antennæ about as in *H. chelifer*. Posterior maxillipeds rather strongly built, though not nearly so powerful as in that species, hand rounded oval in form. First pair of legs resembling in structure those in *H. chelifer*, but with a greater number of claws at the tip of the outer ramus. Last pair of legs with the inner expansion of the proximal joint very large and broad, carrying 4 marginal spines, distal joint comparatively smaller.

Male, as usual, somewhat larger than female, with the urosome narrower and distinctly 5-articulate. Anterior antennæ with the dactylus securiform in shape, projecting outside in a strong spiniform process. Outer ramus of 3rd pair of legs somewhat less powerfully developed than in *H. chelifer*, 1st joint shorter

than the other 2 combined, last joint armed with 4 spines, the innermost rather slender. Last pair of legs very small.

Colour gray, with a slight yellowish green tinge.

Length of adult female 1.23 mm., of male 1.33 mm.

Remarks.—This form was figured, but not described, by Kröyer in the Atlas to *Gaimard's* well-known work "Voyage en Scandinavie". It is much the largest of our Harpactici, and is moreover easily recognizable by its comparatively broad, sub-depressed body. The *Harpacticus nordlandicus* of Boeck is unquestionably identical with this species; and the form recorded by Mr. S. A. Poppe as *Harpacticus chelifer*, var. *arctica*, is also referable to the same species.

Occurrence.—I have met with this form rather frequently along the whole Norwegian coast, from the Christiania Fjord to Vadsö. It is not, however, like the preceding species, a littoral form, but is only found in depths ranging from 20 to 100 fathoms, muddy bottom.

Distribution.—Behring Sea (Poppe), Bear Islands, Spitsbergen (Scott).

34. Harpacticus gracilis, Claus.

(Pl. XXX, fig. 1).

Harpacticus gracilis, Claus, Die freilebenden Copepoden. p. 135, Pl. XIX, fig. 20.

Syn: *Harpacticus elongatus*, Boeck.
„ — *chelifer*, Giesbrecht (not Müller).

Specific Characters.—Female. Body rather slender, with the anterior division slightly depressed, the posterior considerably narrower. Rostrum rather prominent. Caudal rami very short, not nearly as long as they are broad, apical setæ slender and divergent. Anterior antennæ rather elongated, attaining the length of the cephalic segment, 9-articulate, terminal part scarcely exceeding in length $^1/_3$ of the proximal part. Posterior antennæ with the outer ramus normal. Posterior maxillipeds resembling in shape those in *H. uniremis*. First pair of legs comparatively more slender than in the 2 preceding species, with the distal joint of the outer ramus shorter than the proximal one; inner ramus with the outer 2 joints confluent. Last pair of legs with the distal joint oblong in form; inner expansion of proximal joint well developed, though less broad than in *H. uniremis*, marginal spines of both joints rather slender, setiform.

Male exhibiting the usual differences from the female. Outer ramus of 3rd pair of legs considerably incurved, last joint with 3 thickish spines and a long ciliated seta at the inner corner. Last pair of legs very small, with the distal joint somewhat club-shaped, the 2 outermost setæ spiniform.

Colour whitish, with a slight yellowish tinge, and generally banded dorsally with dark brown.

Length of adult female 0.66 mm.

Remarks.—I cannot doubt that the above-described form is that originally recorded by Claus as *H. gracilis*. The *H. elongatus* of Boeck is the same species, and this is unquestionably also the case with the form described by Dr. Giesbrecht as *H. chelifer*, Müller. Prof. Brady seems to have been acquainted with both these forms; but he only regarded *H. gracilis* as a variety of *H. chelifer*, though in reality it is very distinct both in the external form and in the structure of some of the appendages.

Occurrence.—I have found this form occasionally in several places of the Norwegian coast, as far as to the Trondhjem Fjord. It is, like *H. chelifer*, a littoral form, occurring in comparatively shallow water among algæ.

Distribution.—British Isles (Brady), Kiel Bay (Giesbrecht), Mediterranean at Messina (Claus).

35. Harpacticus flexus, Brady.

(Pl. XXX, fig. 2).

Harpacticus flexus, Brady & Robertson, Ann. Mag. Nat. Hist. ser. 4, Vol. XII, p. 134, Pl. IX, figs. 17—21.

Specific Characters.—Female. Form of body resembling that in *H. gracilis*, though perhaps still more slender. Rostrum less prominent. Caudal rami broader than they are long. Anterior antennæ unusually short, being scarcely half as long as the cephalic segment, 9-articulate, terminal part about half the length of the proximal one. Posterior antennæ with the outer ramus very narrow and provided with only 3 setæ. Posterior maxillipeds rather unlike those in the 3 preceding species, the hand being narrow fusiform and the dactylus very slender. First pair of legs of much the same structure as in *H. gracilis*. Last pair of legs likewise rather similar, but with the distal joint comparatively smaller, and the marginal spines shorter, scarcely setiform.

Colour rather peculiar, the greater part of the anterior division being tinged with deep crimson, cephalic segment and urosome white.

Length of adult female 0.70 mm.

Remarks.—This form, first described by Messrs. Brady & Robertson, may be easily distinguished from the other species of the present genus by the shortness of the anterior antennæ and the rather different shape of the posterior maxillipeds. In the living state it is moreover readily recognized by its peculiar and beautiful colouring.

Occurrence.—Only some few specimens of this form have hitherto come under my notice. They were taken, some in the upper part of the Christiania Fjord, and some off the west coast of Norway in comparatively shallow water among algæ.

Distribution.—British Isles (Brady).

Gen. 14. Tigriopus, Norman, 1868.

Generic Characters.—General form of body resembling that in *Harpacticus*, though comparatively more attenuated behind. Anterior antennæ more robust, in male very strong, subchelate. Posterior antennæ with the outer ramus composed of 4 distinctly-defined articulations. Oral parts on the whole resembling in structure those in *Harpacticus*. First pair of legs, however, with the outer ramus distinctly 3-articulate, last joint small but well defined, and armed at the tip with a number of sharply curved claws. Inner ramus of 2nd pair of legs in male with the middle joint produced at the end both outside and inside in a deflexed spine; outer ramus of 3rd pair of exactly the same appearance in the 2 sexes. Last pair of legs of a structure similar to that in *Harpacticus*, but with the marginal spines very slender, setiform.

Remarks.—This genus, proposed in the year 1868 by Norman, is closely related to *Harpacticus*, and was not, indeed, accepted by Prof. Brady in his Monograph. Yet it seems to me that the genus ought to be maintained, on account of some well-marked differences to be found in the structural details in both sexes. The genus contains as yet only a single species, to be described below.

36. Tigriopus fulvus (Fischer).

(Pl. XXXI & XXXII).

Harpacticus fulvus, Seb. Fischer, Beiträge zur Kenntniss der Entomostraken. Abh. d. König. Bayer. Akad., Vol. VIII, p. 656, Pl. I, figs. 30—33; Pl. II, figs. 34—39.

Syn: *Harpacticus chelifer*, Lilljeborg (not Müller).
„ — *curticornis*, Boeck.
„ — *crassicornis*, Brady & Robertson.
„ *Tigriopus Lilljeborgii*, Norman.

Specific Characters.—Female. Anterior division of body much broader than the posterior and, seen dorsally, oblong oval in form. Rostrum comparatively

short and blunt at the tip. Urosome rather narrow, almost linear in form, with the segments finely spinulose at the hind edges. Caudal rami somewhat longer than they are broad, apical setæ rather slender, the innermost but one more than twice as long as the urosome. Anterior antennæ somewhat exceeding half the length of the cephalic segment, 9-articulate, the proximal joints comparatively thick and robust, terminal part rather slender. Outer ramus of posterior antennæ with the 1st joint longer than the other 3 combined. Anterior maxillipeds comparatively broad; posterior ones with the hand oblong quadrangular in form, palm not defined, dactylus strong and curved. First pair of legs rather strongly built, outer ramus with the 1st joint about the length of the other 2 combined; last joint armed with 5 very sharp and smooth claws and 2 setæ; inner ramus with the outer 2 joints imperfectly defined, and carrying on the tip a strong claw-like spine. Last pair of legs with the inner expansion of the proximal joint very large, extending somewhat beyond the distal joint, and armed with 5 slender spines, one of which is very long; distal joint oval in form, with 5 similar spines. Ovisac very large.

Male about the same size as the female, but having the posterior division of the body considerably narrower. Anterior antennæ very strong, hand nearly globose, dactylus simple, claw-shaped. Inner ramus of 2nd pair of legs with the middle joint considerably expanded, outer projection smooth, inner somewhat longer, and densely hairy in its outer part. Last pair of legs very small, proximal joint but very slightly expanded inside, and provided with a solitary seta, distal joint oval, with 4 spiniform setæ.

Colour dark yellow or orange.

Length of adult female 1.20 mm.

Remarks.—This form was first described by Prof. Lilljeborg, who, however, erroneously identified it with *Cyclops chelifer* of O. Fr. Müller. It was some years afterwards recorded by Seb. Fischer as *Harpacticus fulvus*, and the specific name proposed by that author ought accordingly to be retained and preferred to those given to the species by Boeck and Norman, which are of later date.

Occurrence.—This form is found along the whole Norwegian coast, and often in great abundance, in small rock-pools at, or more generally somewhat above, high-water-mark. The water in these pools is more or less brackish and often exhibits a very high temperature by long exposure to the sun. I have also occasionally found this form in perfectly fresh water, but in no cases at any great distance from the shore, and it is reasonable, therefore, to assume that at times

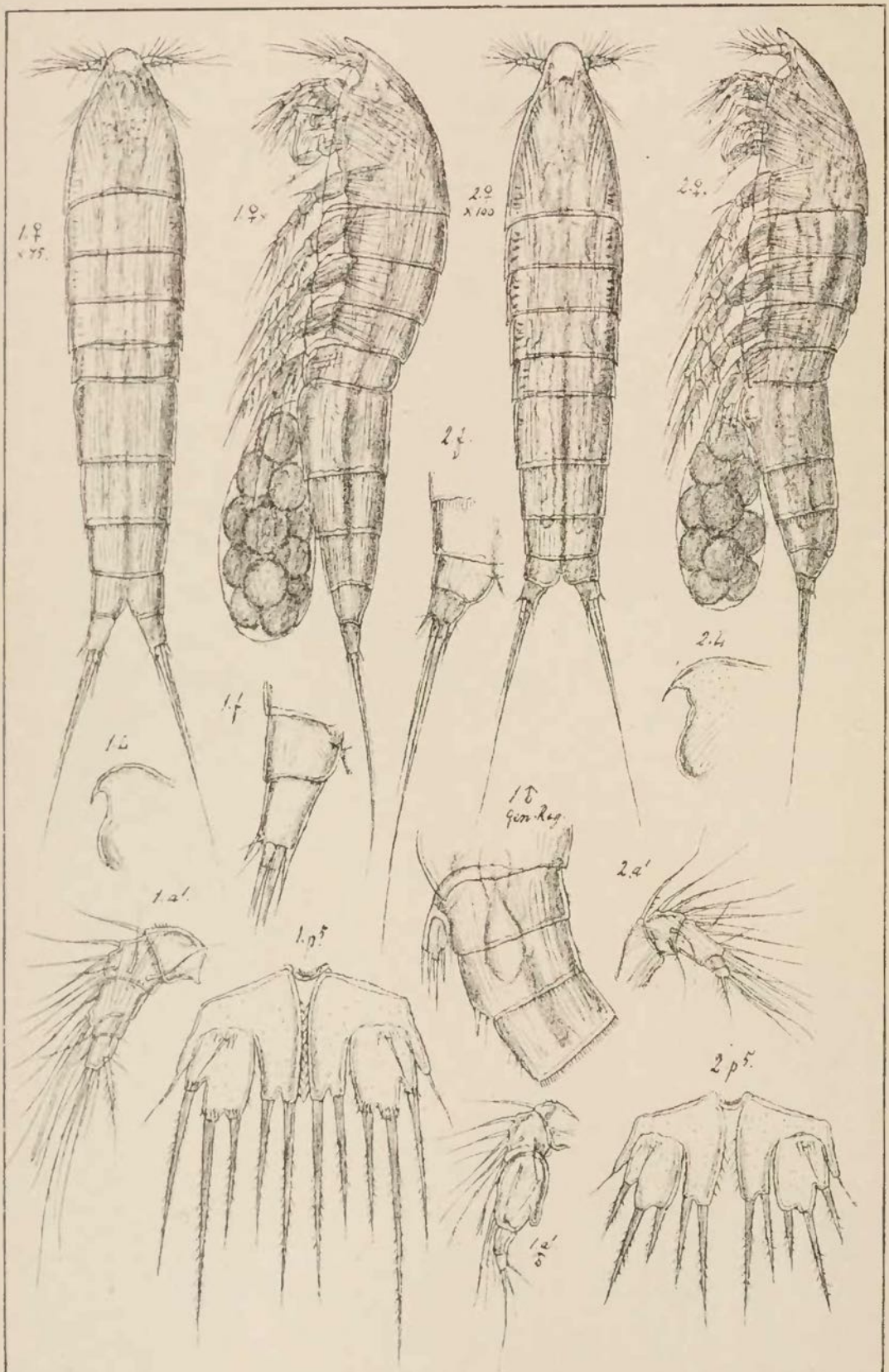
such places, by heavy storms or excessively high tides, are exposed to some admixture of salt water.

Distribution.—British Isles (Brady), coasts of Sweden (Lilljeborg), France (Canu), Madeira (Fischer), Kerguelen Islands (Brady).

Gen. 15. **Zaus**, Goodsir, 1845.

Generic Characters.—Body short and broad, flattened, with the segments of the anterior division lamellarly expanded laterally. Rostral plate broad, subtruncate at the tip. Last pedigerous segment very small, without any distinct epimeral plates. Urosome narrower than the anterior division, though having the anterior segments somewhat expanded laterally; genital segment in female with distinct traces of a subdivision. Caudal rami short, with the normal number of setæ. Anterior antennæ in female 9-articulate, terminal part comparatively short; those in male strongly prehensile. Posterior antennæ well developed, with the spines of the terminal joint in most cases densely fringed with cilia on the one edge; outer ramus comparatively small, biarticulate. Oral parts on the whole resembling in structure those in *Harpacticus;* posterior maxillipeds, however, comparatively smaller. First pair of legs, as in *Harpacticus,* with both rami distinctly prehensile and of very unequal length, the outer one being much the longer and biarticulate, tipped by a number of strong claws. The 3 succeeding pairs rather slender, and of exactly same structure in the two sexes. Last pair of legs more or less extended laterally, distal joint comparatively large, inner expansion of proximal joint in female very broad, though not much prominent, in male rudimentary. Ovisac broad, flattened.

Remarks.—This genus, established as early as the year 1845 by Goodsir, has by most authors been referred to the family *Peltidiidæ,* on account of the broad flattened body. The several appendages, however, are built upon the very same type as in the genus *Harpacticus,* and the present genus ought therefore more properly to be included in the family *Harpacticidæ* as here defined. It may be noted here, that one of the characters assigned to this genus by Prof. Brady, viz., "head distinct from cephalothorax" does not hold stand. The head is in reality, as in most other Harpacticoids, wholly united with the 1st pedigerous segment; nor is the outer ramus of the 1st pair of legs, as indicated by that author, 3-articulate, but like that in *Harpacticus,* only composed of 2 joints.



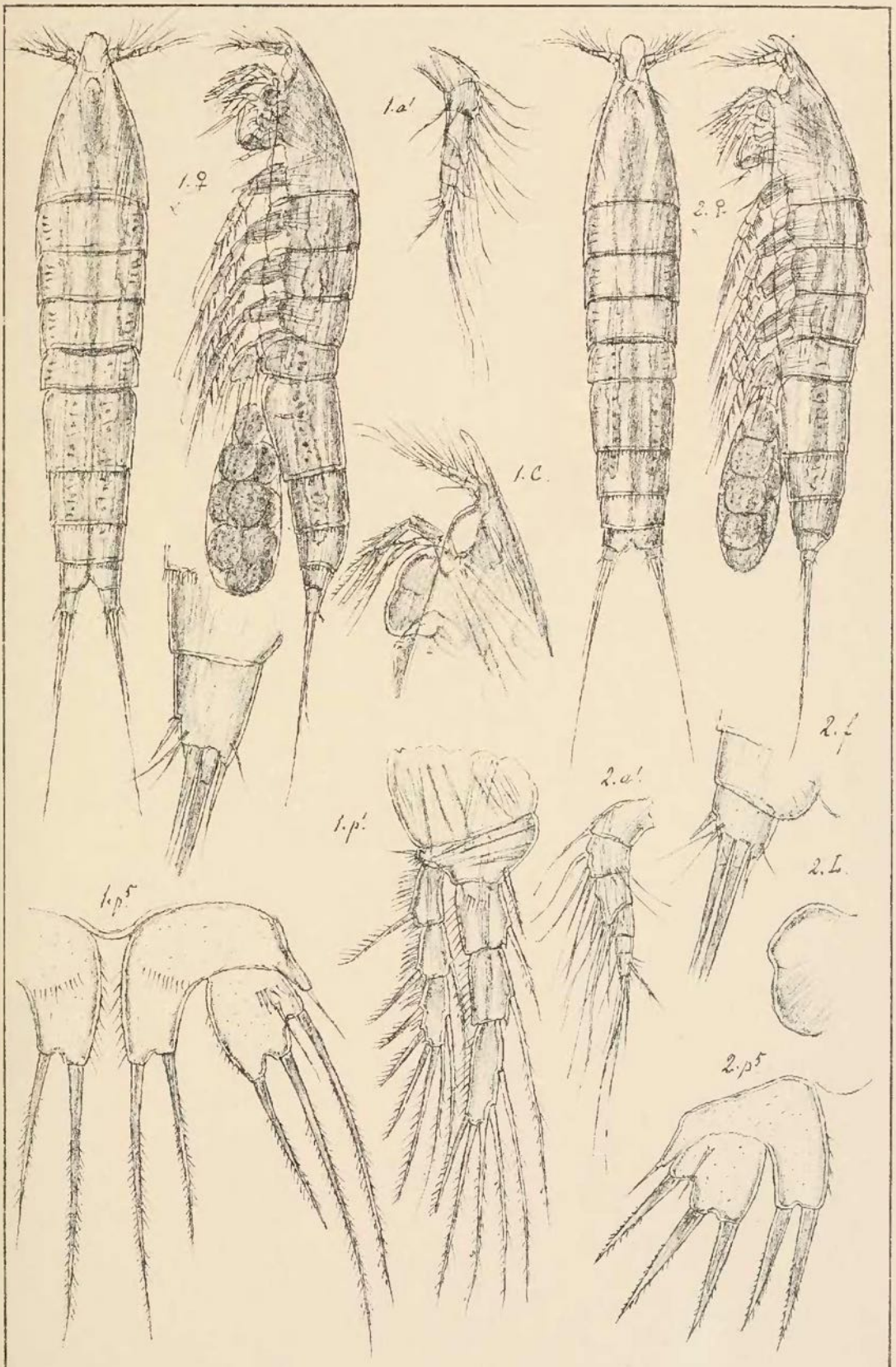
G.O. Sars autogr.

1 Ectinosoma neglectum, G.O. Sars
2 " propinqvum, Scott.

Trykt i den private Opmaaling. Chra

Copepoda

Ectinosomidæ — Harpacticoida — PI.XVIII



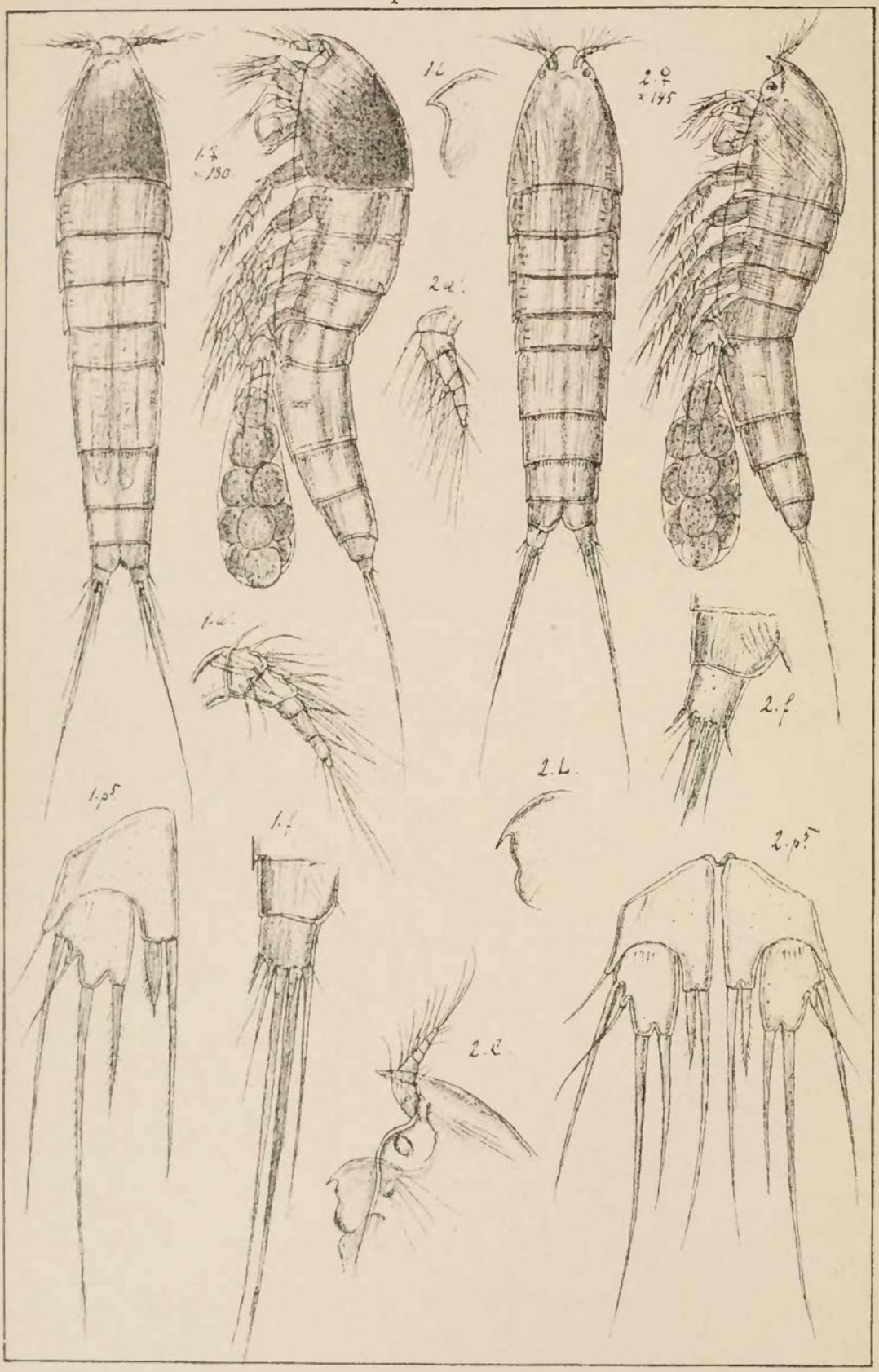
G.O Sars autogr.

1 Ectinosoma elongatum, G. O. Sars
2 " Herdmani, Scott

Trykt i den private Opmaaling, Chra

Copepoda

Ectinosomidæ — Harpacticoida — PLXIX



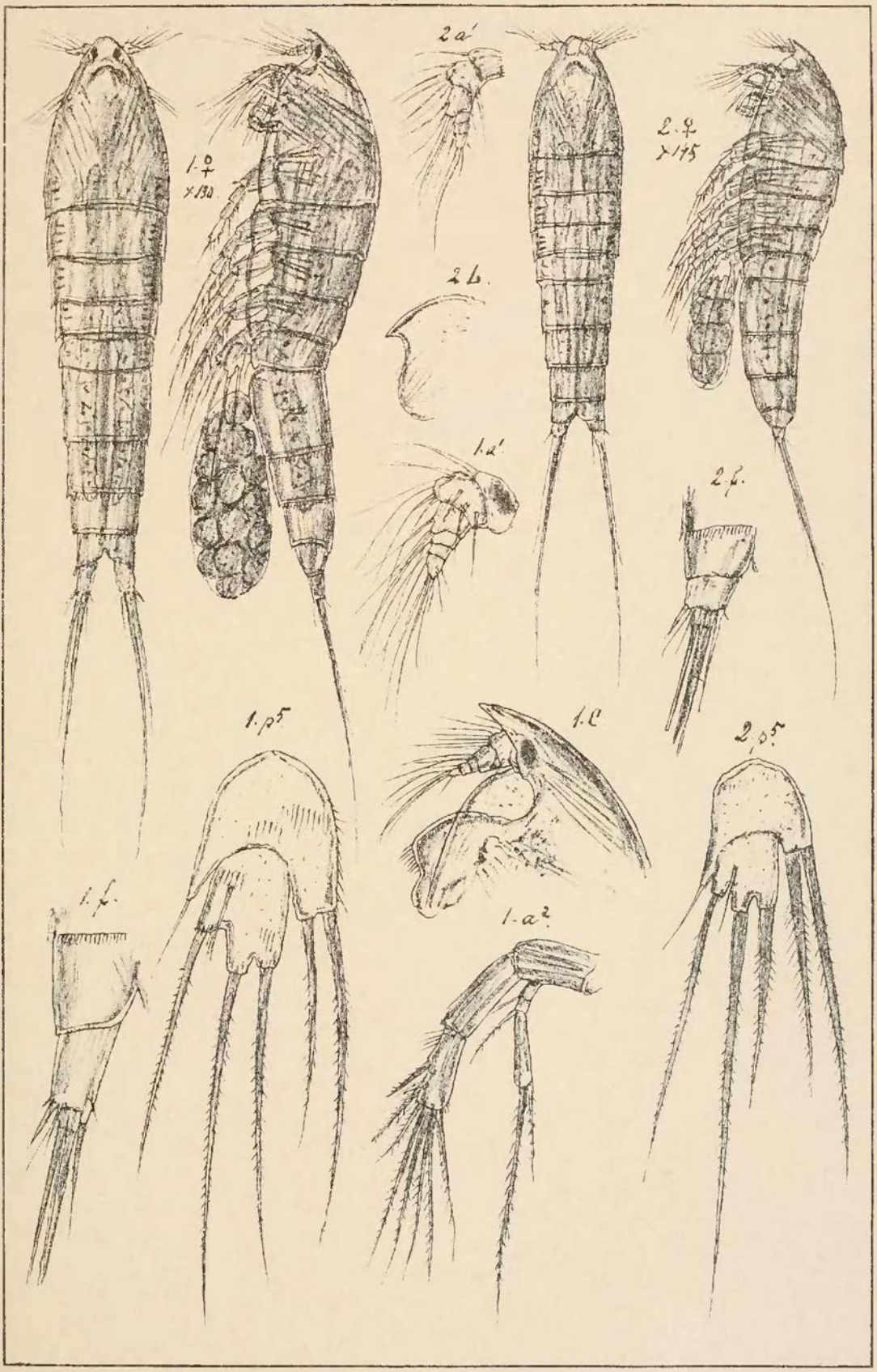
G.O. Sars autogr.

1 Ectinosoma melaniceps, Boeck
2 " Normani, Scott.

Trykt i den private Opmaaling, Chra

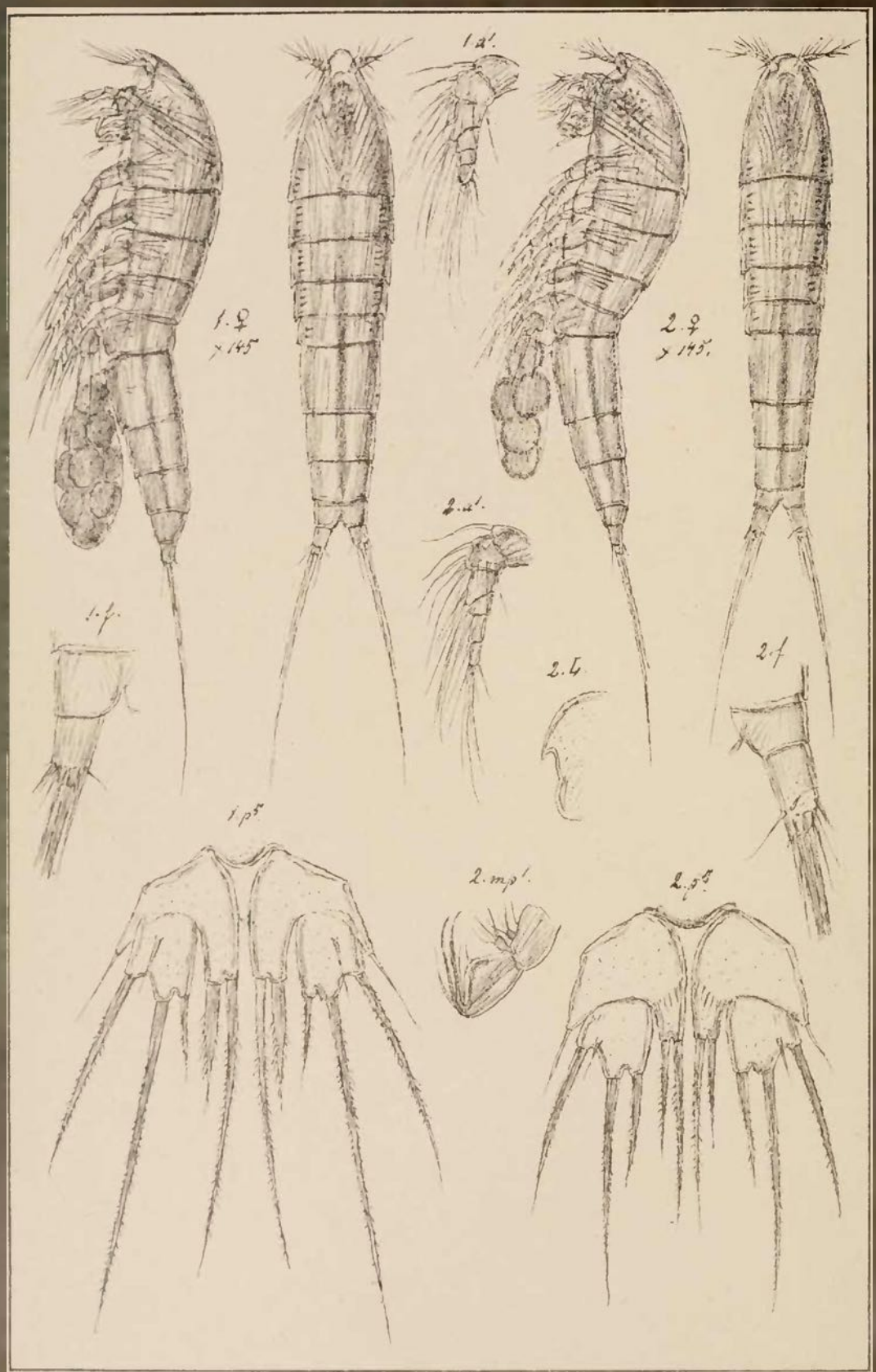
Copepoda

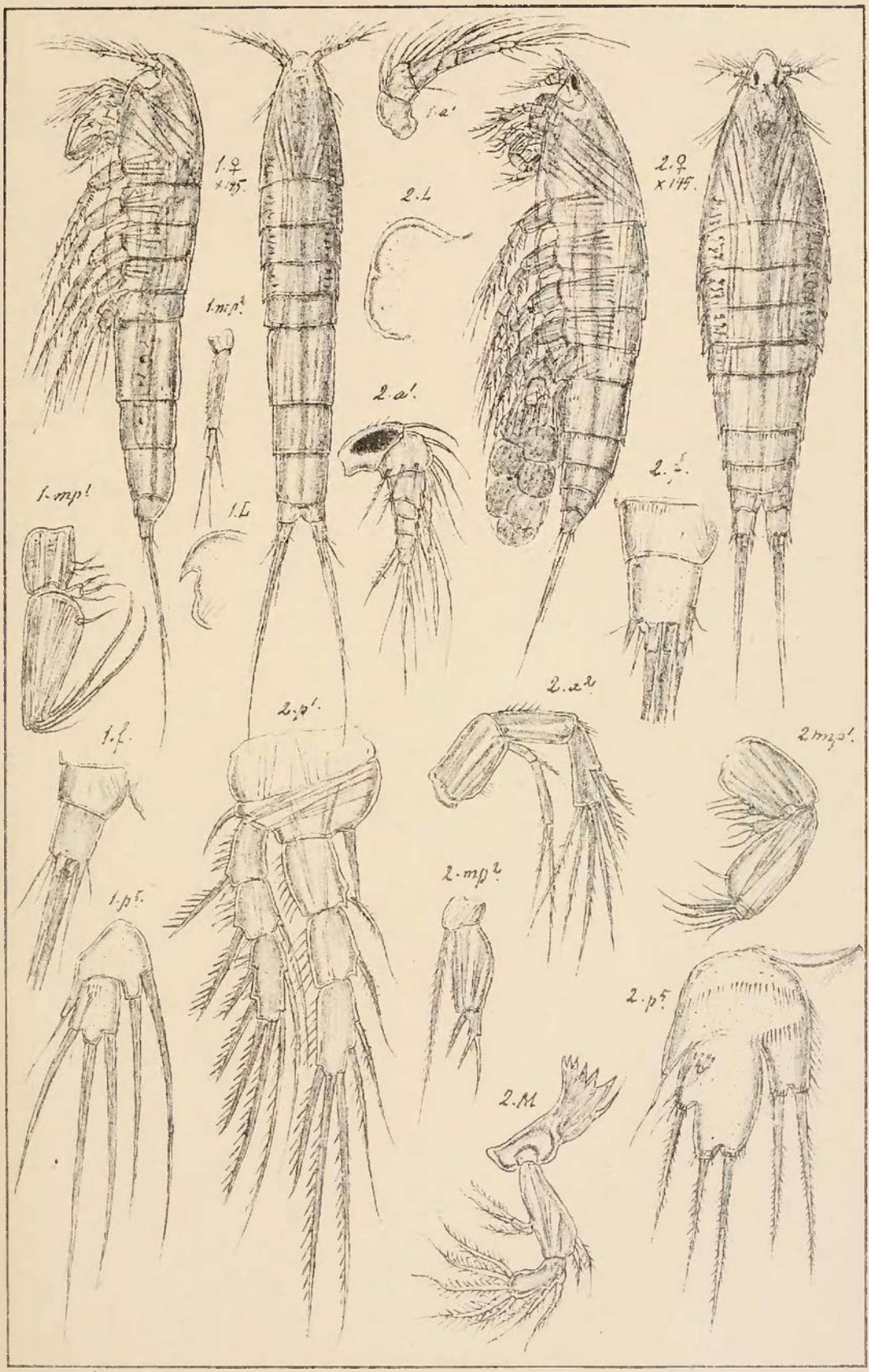
Ectinosomidæ — Harpacticoida — PlXX



G.O. Sars autogr. 1 Ectinosoma curticorne, Boeck
2 " gothiceps, Giesbrecht

Trykt i den private Opmaaling, Chra

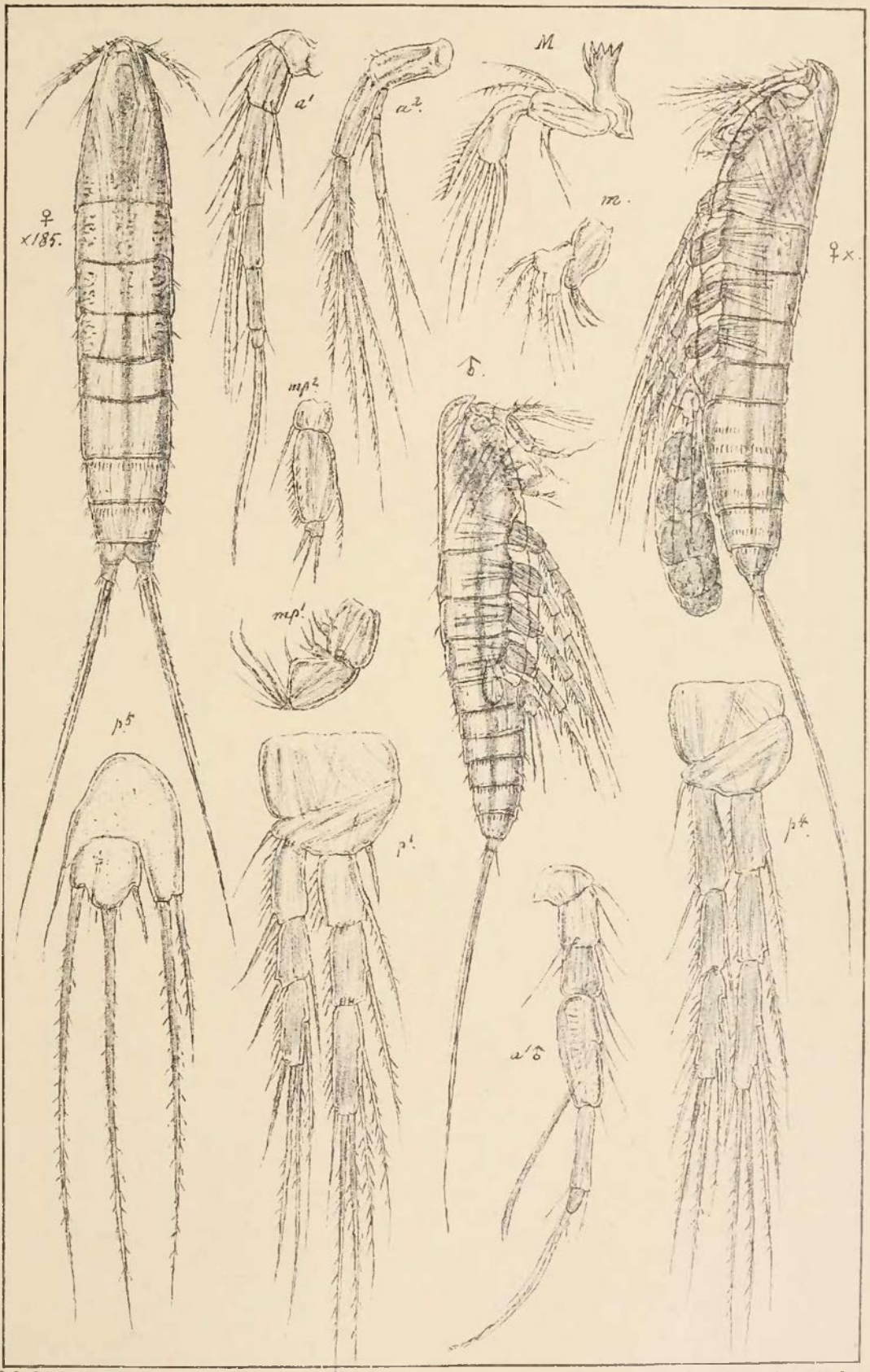

1.a'.
1.♀
× 145
2.♀
× 145.
2.a'.
1.f.
2.f
2.L
1.p5
2.mp'.
2.p5



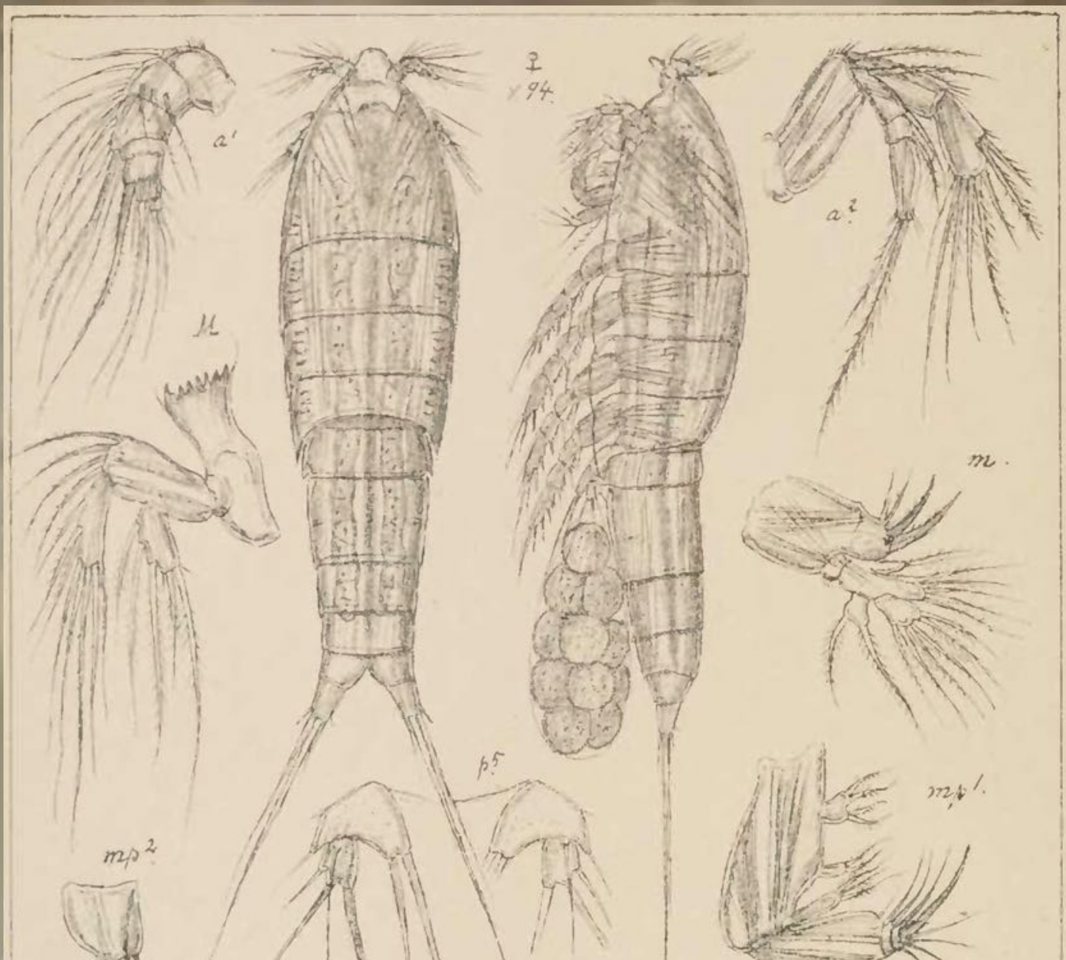
G.O. Sars autogr. Trykt i den private Opmaaling. Chra

1 Ectinosoma gracile, Scott.
2 Pseudobradya minor (Scott.)

G.O. Sars autogr. 1 Pseudobradya acuta, G. O. Sars Trykt i den private Opmaaling. Chra



G.O Sars autogr. Microsetella atlantica, Brady Trykt i den private Opmaaling. Chra



♀
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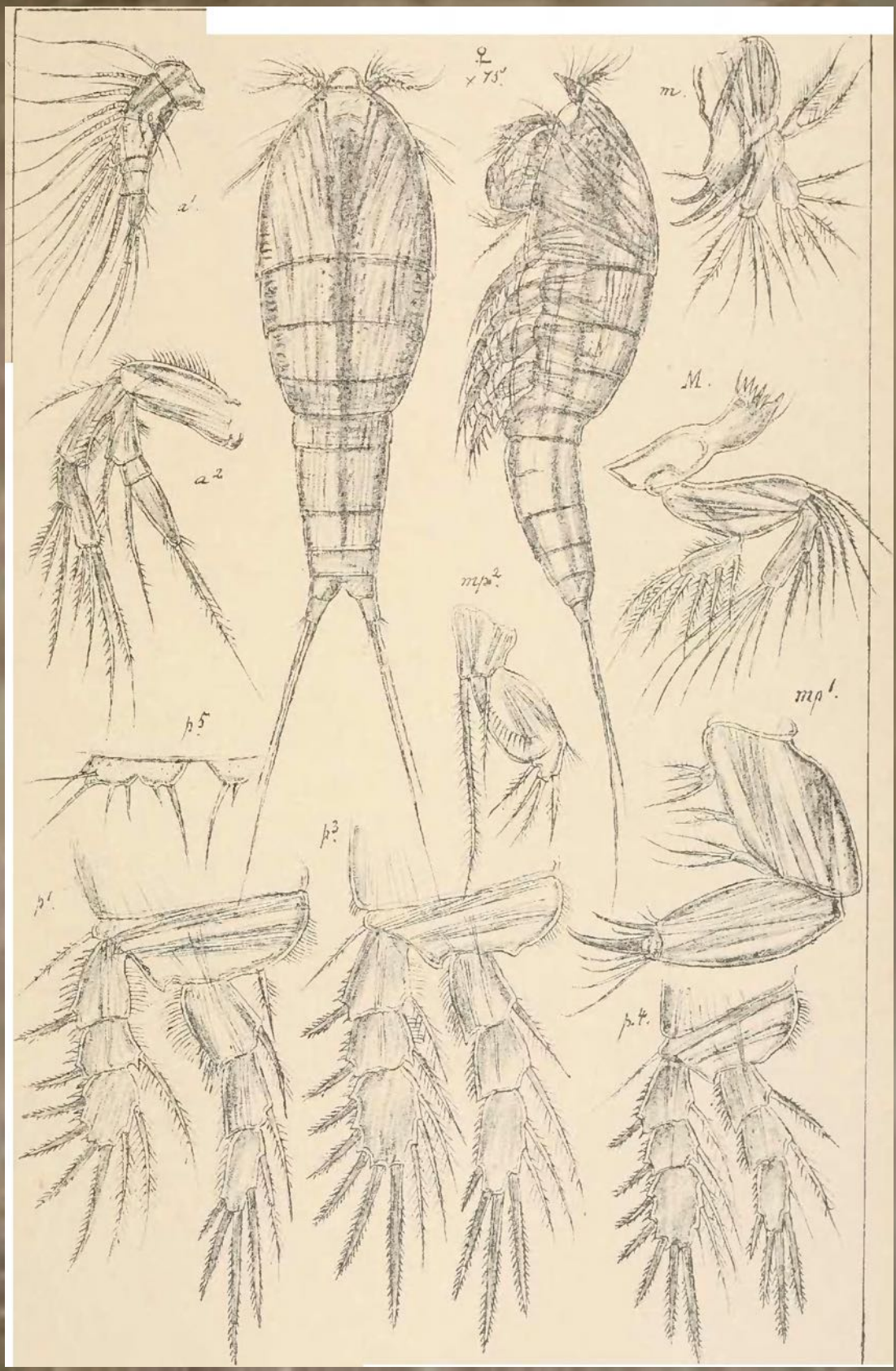
a²
M
m.
mp¹.
mp²
p⁵
p¹.
p³
p⁴.
f


♀
× 75
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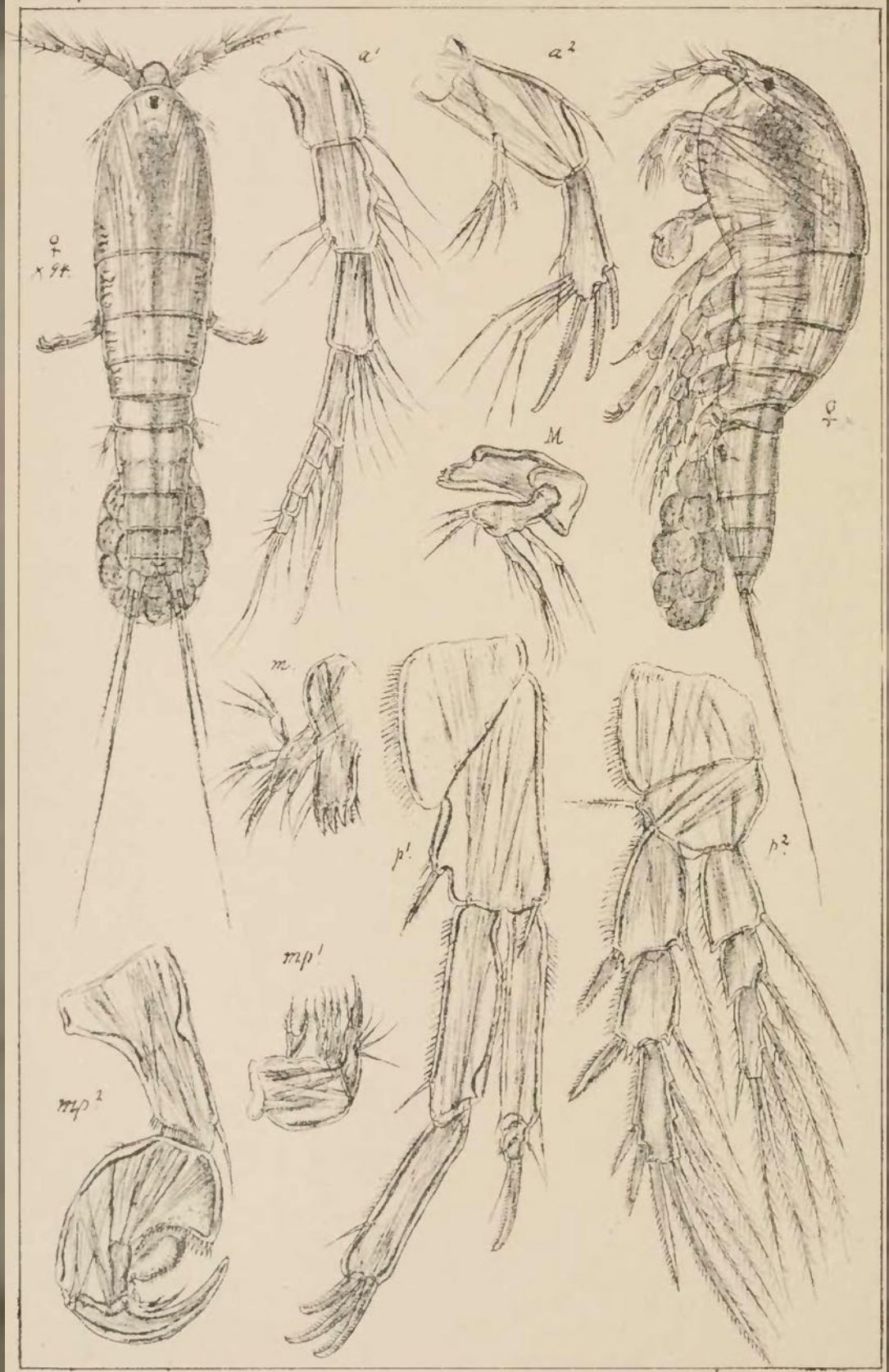
a²
m
M
mp²
mp¹
b⁵
b³
b¹
b⁴

Copepoda

Harpacticidæ — Harpacticoida — Pl. XXVII



Copepoda

Harpacticidæ — Harpacticoida — Pl. XXVIII

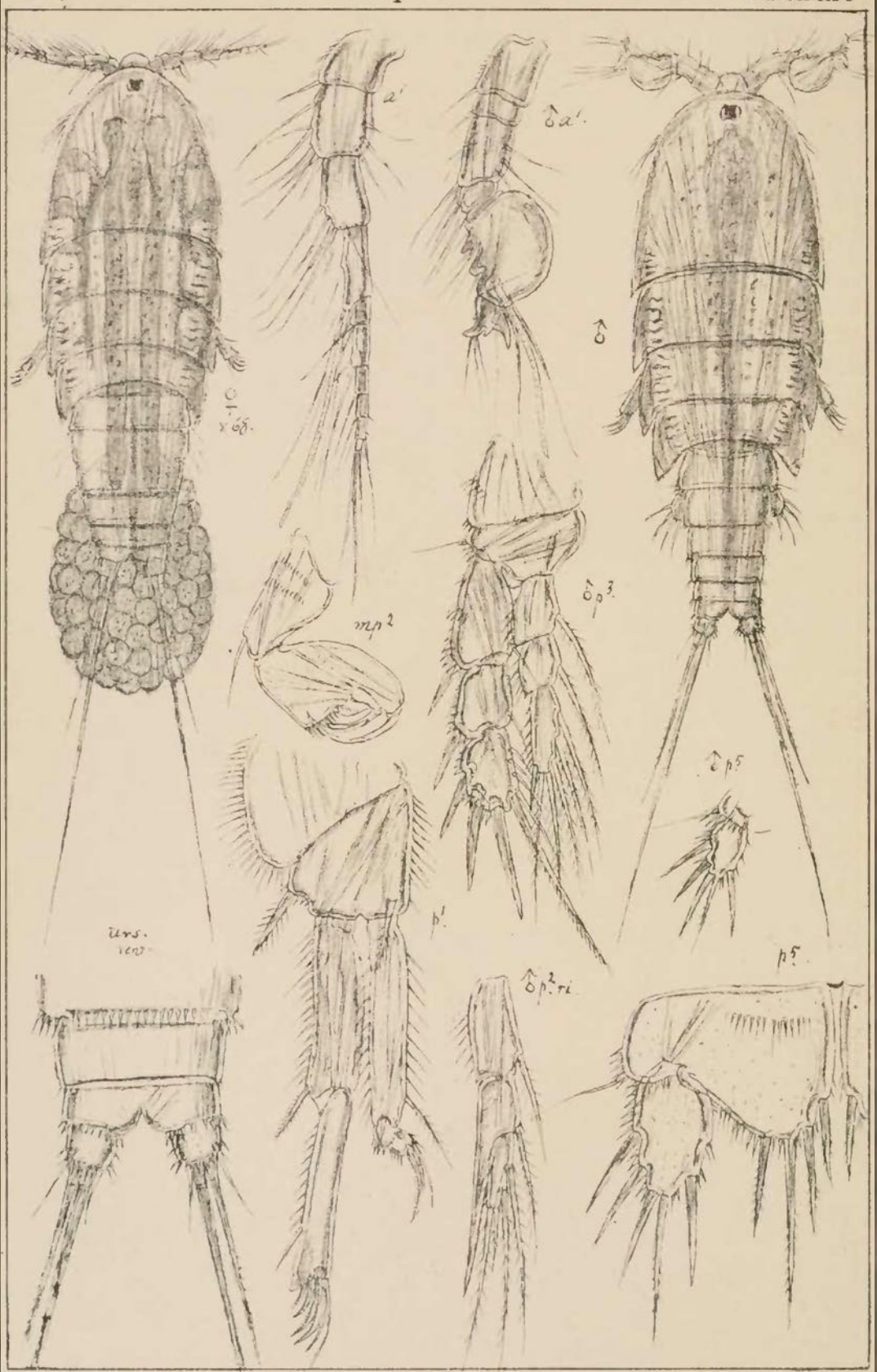
G.O Sars autogr.

Norsk lith Otficin Kr.a

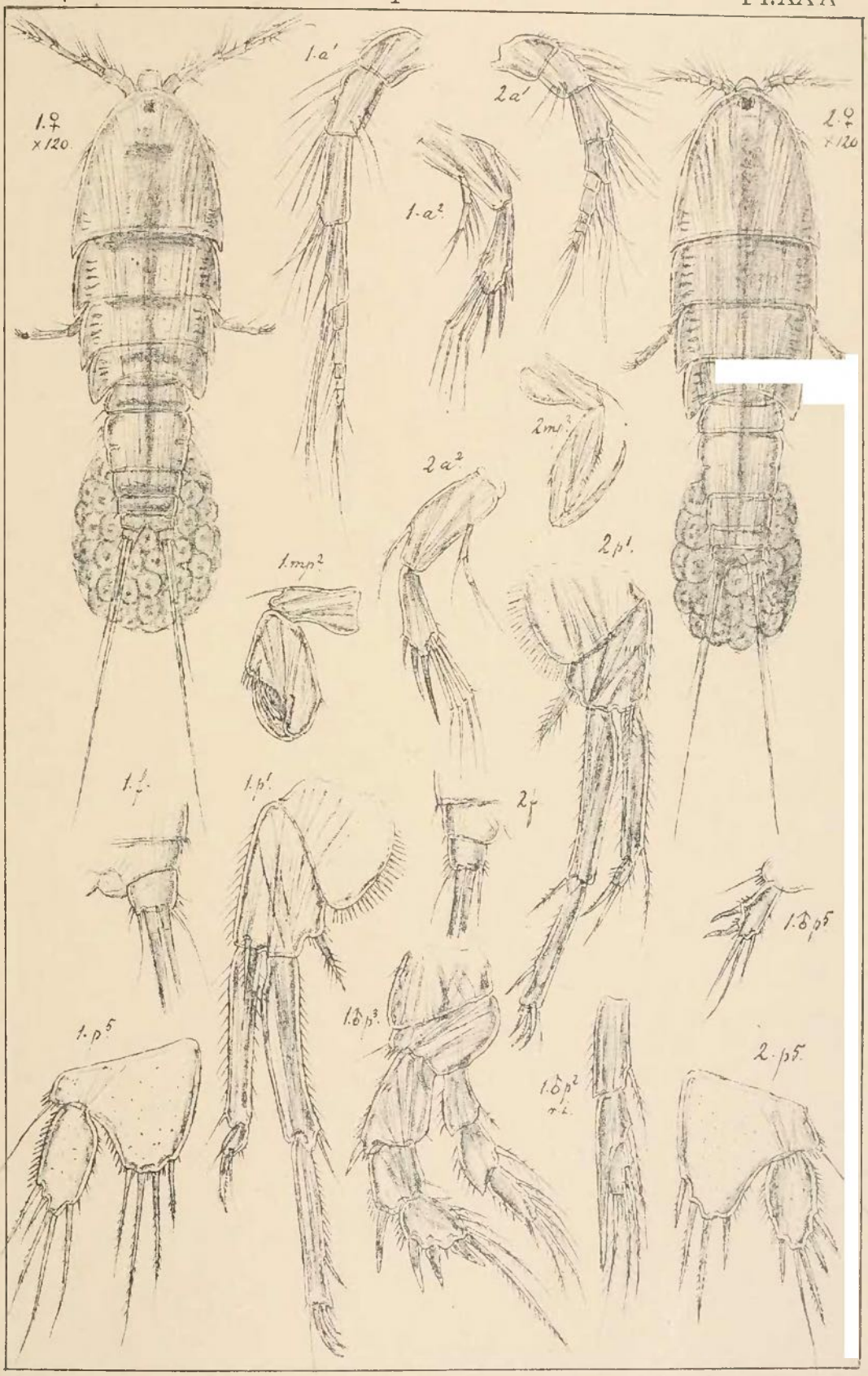
Harpacticus chelifer, (Müller).

(continued)

Copepoda

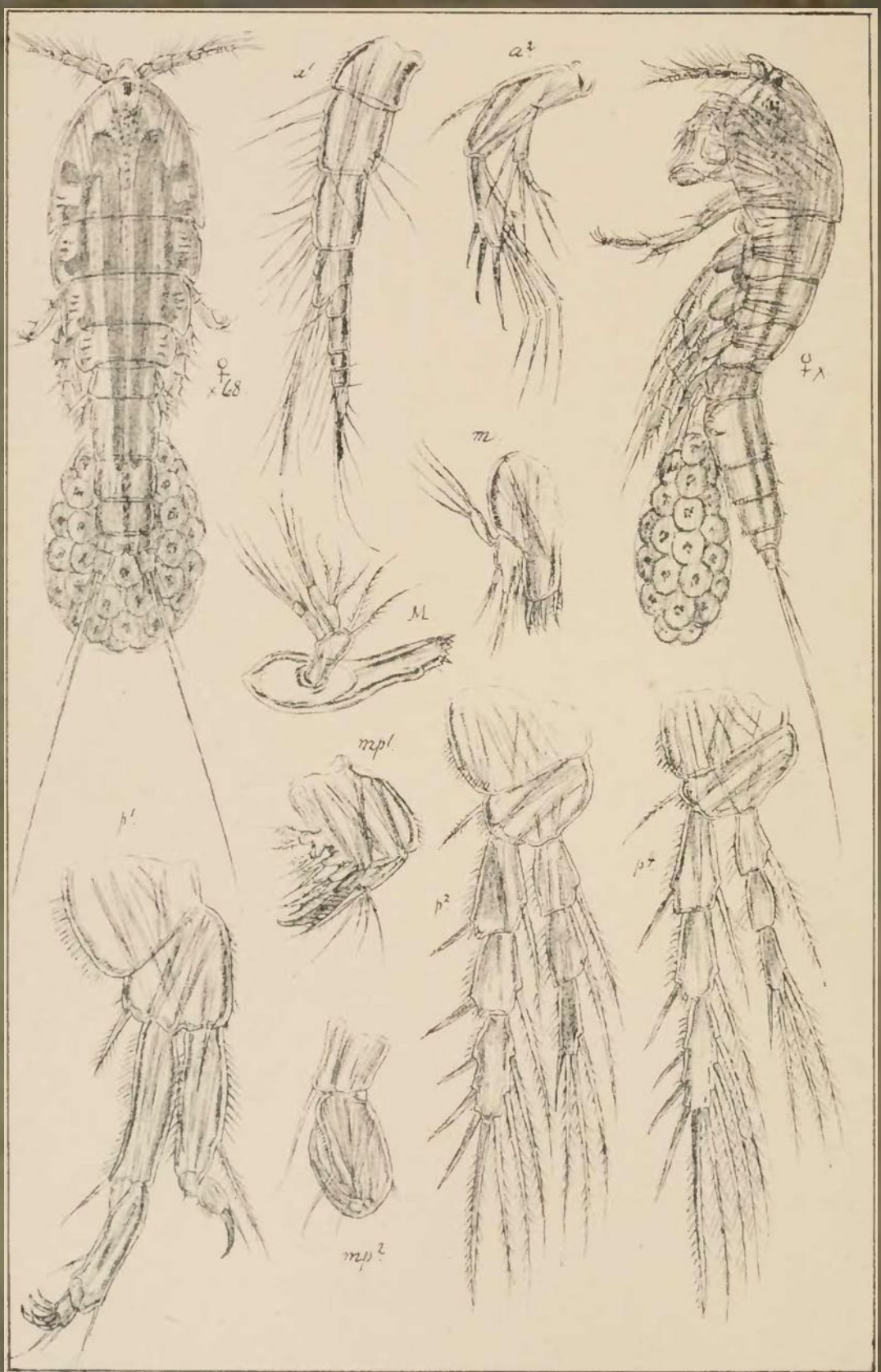


Copepoda



1 Harpacticus gracilis, Claus.
2 „ flexus, Brady.

G.O Sars autogr. Norsk lith Officin Kr.ª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a²
♀ x 4
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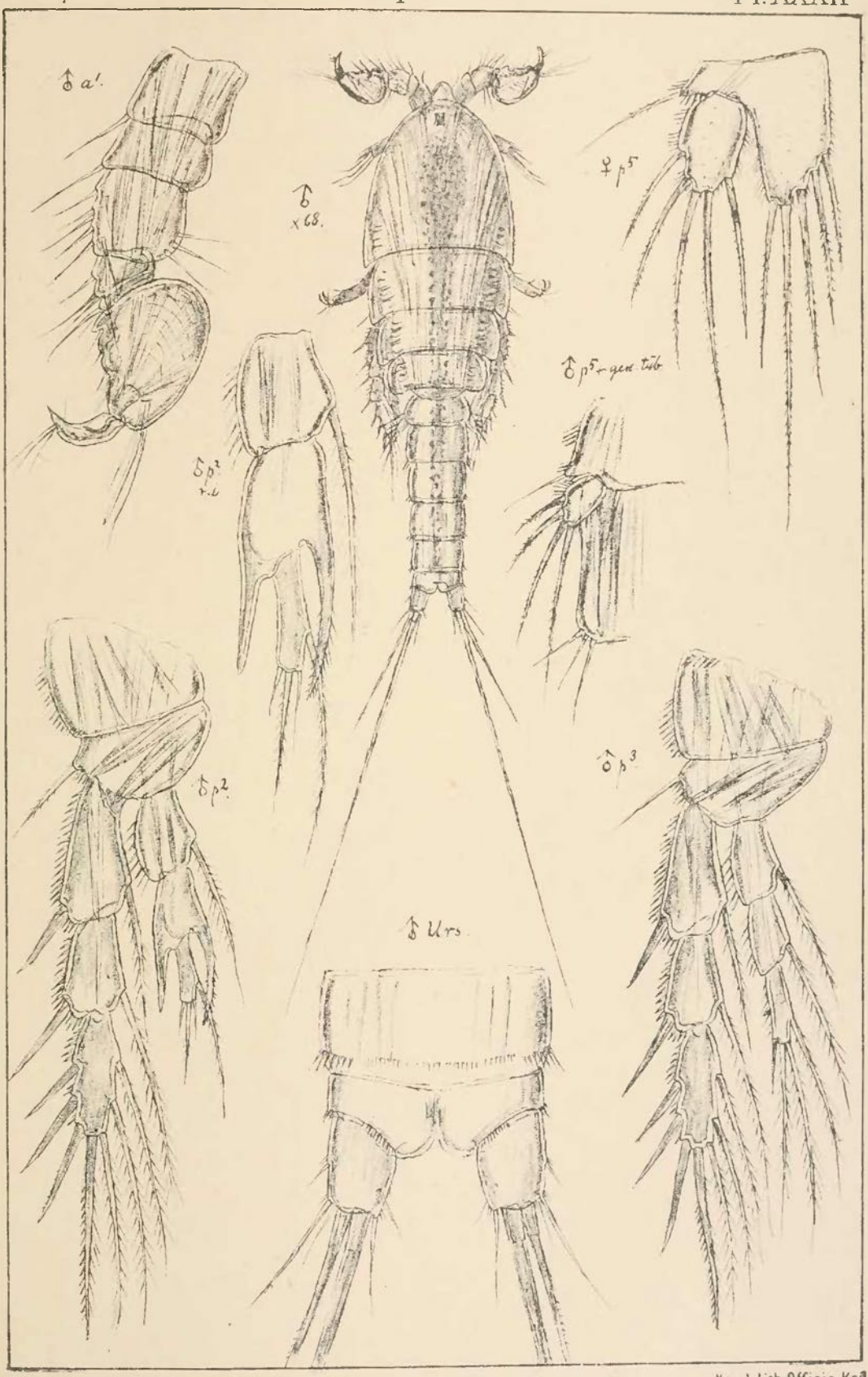
ML
mp¹
h¹
h²
p²
mp²



G.O Sars autogr.

Tigriopus fulvus, Fischer.
(continued)

Norsk lith Officin Kr.ª